3 1761 07529146 8

CRUISE OF THE MINNIE MAUD

ARCTIC SEAS AND HUDSON BAY

ALFRED TREMBLAY

The Minnie Maud

Digitized by the Internet Archive
in 2010 with funding from
University of Ottawa

http://www.archive.org/details/cruiseofminniema00trem

Alfred Tremblay,
Arctic Explorer and Veteran of the Great War

HPolar
T7892c

CRUISE OF THE MINNIE MAUD

ARCTIC SEAS *and* HUDSON BAY

1910-11 *and* 1912-13

BY

ALFRED TREMBLAY

Veteran of the Two Arctic Expeditions
and of the Great War 1915-18

COMPILED AND TRANSLATED BY

A. B. READER

170353
10.4.22.

PUBLISHED BY
THE ARCTIC EXCHANGE *and* PUBLISHING Limited
QUEBEC, CANADA
1921

CANADIAN COPYRIGHT, 1921

PRINTED FOR THE PUBLISHERS BY *L'Evenement Press, Quebec.*

Dedicated

To All Those Who Aided Us

To the Canadian People

To Our Mother Countries

Captain Bernier
Commander of several Arctic Expeditions and Commanding Officer of the "Minnie Maud"

FOREWORD

THE Cruise of The Minnie Maud to the arctic seas, 1910-11-12-13 was made in 1912—When the news appeared in the Press that gold had been found in the Arctic Islands, by Robert S. Janes, of Newfoundland, three expeditions were arranged, one from Newfoundland, another from Montreal, and ours from Quebec. One was lost in Ponds Inlet, another turned a failure to St. John, Newfoundland, and ours was a success, not in gold, but we paid our expenses, besides the knowledge we now put before the public. One of our party Mr. A. Tremblay was sent with another person, M. G. Wilson and a family of Eskimoes, named Peewiktoo, the same which had gone with Lavoie the year before, to look for mineral, game and other things of interest. Mr. A. Tremblay now makes his report of what he has seen and done, and he deserves encouragement, being perseverant and honest, so may he succeed in his endeavors to finish his travels and give his fellow citizens a clear truthful report of his travels

J E Bernier

QUEBEC, June 7th 1921.

Mr. A. B. Reader

PREFACE

THERE is undoubtly a plethora of books in the world and by adding another to the list one assumes some small measure of responsibility. The only plea, put forth in extenuation, is that the present volume is designed to be, while of interest to the general reader in search of true tales of sport, travel and adventure, of permanent value as a guide and reference to all those, whether they be sportmen, navigators, prospectors, explorers or tourists, who are more especially interested in the remote and comparatively unknown spaces of the frozen Northland.

A year's sojourn among the Eskimos of North Baffin Land brought the conviction that there was yet room for an authentic and practical handbook of Arctic Canada which would include a history, in brief, of Arctic Exploration to date, and of Hudson Bay—that vast inland Canadian Sea—its physical features and commercial and other potentialities; potentialities that are fast becoming present-day possibilities in view of the near completion of the Hudson Bay railway.

It is true that Mr. A. P. Low, the able geologist and historiographer of the Canadian Government, in his valuable and extremely interesting volume entitled "The Cruise of the Neptune—1903-04"—printed by the Department of Marine and Fisheries at Ottawa— contains a full account of the known geology, to that date, of the Arctic Islands; a valuable historical summary of the search for the Northwest Passage, and a couple of chapters, replete with interesting detail, of the life and habits of the Eskimos. Only a limited number, however, of that volume was printed and, apparently, copies of Mr. Low's work are no longer available for the public; nor are the archives of a Governement department as readily accessible to the reading world as is the public book-stall.

The author begs to convey his sincere appreciation of the great value and assistance rendered by the published records and excellent maps of the Canadian expeditions, entitled "Cruise of the Neptune 1903-04", "Cruise of the Arctic 1906-07" and "Cruise of the Arctic 1908-09"; and by the explorations in and around Hudson Bay made by J. Burr Tyrrell in 1893 and 1894; by A. P. Low in 1897, 1898 and 1899, and by Dr. Robert Bell in 1897.

"The North Pole" by Commander Robert E. Peary, U. S. N., is another valuable and beautifully arranged and illustrated volume which contains a fascinating account of the manner in which the well-nigh insuperable difficulties and dangers of the Arctic were foreseen and overcome by American "system", daring and resource, and from which the short, epitomised account of the conquest of the North Pole, was obtained. The manner in which the prow of the "Rosevelt" was pushed, cajoled and "butted' through the gigantic ice-floes and bergs of Kennedy and Robeson Channels to Cape Sheridan in Latitude 82° north constitute in itself an enthralling epic of the north.

Information from a variety of other sources, including able Press articles by experts on such subjects as the winter navigation of the St. Lawrence, the movements and ever-recurring dangers of the ice-berg flotillas off the coasts of Labrador and Newfoundland, the history of the early discovery of America by the early Norsemen, the whaling industry, etc., have been consulted and included in the present volume.

An interesting speculation as to the origin of the white Eskimos discovered by Steffannsson on the shores of Coronation Gulf and their probable connection with the Whaleman and with the mysterious disappearance of Sir John Franklin's party will be found in Chapters VI and XIV.

The history of Arctic exploration and of the struggles, unflinching courage and endurance displayed by the early navigators, is a subject that should never be allowed to die out and become forgotten. As many of those records are extremely difficult of access, are out of print or so widely scattered as to be practically unobtainable by the general reader, an effort has been made in Chapter XIV to give as complete a summary, chronologically arranged, as was possible from the date available, of the different expeditions that were undertaken in search of the Northwest Passage, the North Pole, and the search for Franklin. These expeditions resulted in the enrichment of the commerce and industry of the world by tens of millions of dollars from the whale, walrus and seal-fisheries that were established as a result of the voyages of William Baffin and Henry Hudson at the end of the sixteenth century; they also contributed in a large measure to the enrichment of the world's store of scientific, nautical, geographical, geological and astronomical knowledge the definite location of the Magnetic Pole, for the benefit of commercial navigation, not to mention the invigorating and tonic influence that it exercised upon the rising generations through the unparalleled daring, fortitude and resource, pushed to the very limit of human endurance, that was displayed by the cream of the northern races, notably the Scandinavian, British and American, in their long and brilliant struggle for supremacy over those remorseless foes, frost, ice, fog, storm, darkness, hunger and disease:

In all probability the history of Arctic exploration is the most romantic and the least sordid page in all the history of the world and forms the finest and most enduring movement to human valour, patience, skill and self-sacrificing devotion to duty in face of the direst odds and most depressing and dangerous conditions possible to meet with and that makes the fabled epics of ancient Greek mythologies pale in comparison. The story of the search for Franklin and his gallant but ill-fated comrades will stand for all time as the noblest and most unselfish task ever undertaken in the history of mankind.

No such lofty purpose, we are fain to confess, inspired the voyage of the Minnie Maud—it was gold—the sordid lure of gold and the hope of filthy lucre that impelled nine men—six French Canadians, two Englishmen and one New Zealander—to venture forth from the shadow of the ancient embattlements of old historic Quebec in a two masts schooner and brave the perils and rigours of the Arctic seas and wilds.

The existence of gold in the rocks of Baffin Land has long been a subject of belief ever since Martin Frobisher, when in search of a northwest passage through the mythical strait of Anian in 1576, picked up some black earth on Hall island, at the entrance of Frobisher Gulf. On his return to England, Frobisher submitted his find to Baptista Angello, an alchemist, who after "coaxing nature" reported that he had obtained gold from the samples submitted to him. As a result, Frobisher fitted out another expedition and in 1578 filled fifteen ships with the supposed ore, but which, after his return to England, proved worthless.

Since Frobisher's time whalers have occasionally brought back accounts of gold nuggets having been picked up on the northern beaches, but not much credence was given to these so-called sailors' yarns until 1912, when a Newfoundland officer of the Canadian Government Ship "Arctic" gave it out that he had discovered nuggets of gold in the bed of the Salmon River which flows into Eclipse Sound, North Baffin Land. As a result of this report three expeditions were hastily outfitted and sailed from St. John's Newfoundland and Quebec in search of this rumoured Klondike of the Arctic Islands.

Two of these expeditions, under Captains Scott and Munn, sailed from St. John's in July 1912 in the steam-sealers, Neptune and Algerine, while the third sailed from Quebec on July 29th, in the schooner Minnie Maud.

The Algerine was "nipped" in a "lead" between two ice-floes off Erik Harbour, Pond's Inlet, and sank in 20 minutes on July 16th; the members of the expedition and crew, 24 in number, having just time to scramble out on the ice-pans before the ice-floes parted and allowed the crushed vessel to sink into five hundred fathoms of water, taking with her all their effects. Making their way over the ice-pans to Button Point, Bylot Island, they lived on the provisions that the Canadian Government had thoughtfully caused to be cached at Albert Harbour, against such an emergency, until the Neptune arrived two weeks later and took them on board.

The Neptune, too, had a narrow escape from being "nipped" in the heavy ice in Eclipse Sound and of being pushed ashore by ice during a gale on the shoals at the mouth of the Salmon River. Prospectors were sent ashore over the ice to prospect the reported gold placers, but returned in a few days and reported that, after panning the stream to its source, they had not seen the slightest evidence of the existence of gold but found some fine seams of coal in the river bank. They therefore came to the conclusion that the whole Janes story, like that of Frobisher's discovery three hundred years before, was either a delusion or a deliberate hoax.

After bartering with the Eskimos of Pond's inlet and Admiralty Sound, the Neptune, with the members of both expeditions on board, returned to St. John's, Newfoundland, on September 24th laden with three tons of ivory, 76 Polar bearskins and 83 foxskins. On her way back from Pond's inlet, the Neptune called in at Cumberland Sound and grounded on a shoal near Blacklead Island at low water. When the tide rose the ship slid off into deep water. Shortly after this epsiode the staunch vessel nearly foundered off Hudson's Strait in a terrific two days gale.

The Minnie Maud reached Pond's inlet on August 29th, and after spending a couple of days beset in the ice-floes, when she was nearly driven ashore on the rocks by the heavy pressure of the grinding floes, anchored in Albert Harbour on the same day that the Neptune sailed for home. The schooner remained imbedded in the ice at Albert Harbour until the following August, when she sailed for Quebec on August 25th reaching that port on September 25th, after a series of narrow escapes from collision with icebergs and the rock-bound coasts of Belle-Isle Strait.

The members of the expedition lived ashore in wooden shacks and snow igloos with the Eskimos and were engaged during the winter in fox-trapping and barter for ivory, skins and seal-oil and, in the summer of 1913, some 3000 salmon were caught in seines at the mouth of the Salmon River, and were salted away in barrels. The value of the cargo was valued at $25,000. No trace of gold was found at the Salmon River or in the rocks or streams of the adjacent country.

The brightest feature of the expedition was the explorations of Eclipse Sound, Admiralty Inlet, Cockburn land, Fury and Hecla strait and Melville Peninsula made by Alfred Tremblay, a young French-Canadian from Beauport, only twnety-four years of age. Tremblay succeeded, where several well-equipped expeditions despatched had failed, in reaching Igloolik, and Fury and Hecla Strait for the first time since the memorable visit in 1822-23 of Sir W. E. Parry, with his ships Fury and Hecla, when making his third attempt to force a North-West Passage through the ice-bound waters of the North.

Mr. Tremblay, with barely any equipment worthy of the name save for his Ross rifle and Colt Automatic, and with no provisions saving the game that he could shoot and harpoon by the way, covered over 4000 miles on foot in the depth and obscurity of the

Arctic winter, and explored and afterwards, with my assistance, mapped and re-mapped some 3000 miles of coastline. This same work, if carried out by the Government, would have cost the people of Canada, to cover the same ground, at least $75,000.00. As a matter of fact, two costly Government expeditions in the "Arctic," that wintered at Pond's inlet in 1906-07 and at Arctic Bay in 1910-11, made three vain attempts to reach Igloolik and Fury and Hecla Strait by overland expeditions.

Mr. Tremblay, in spite of every obstacle and with the constant risk of death from starvation and cold, was the first white man to cross the land from the head of Admiralty Sound to Fury and Hecla Strait and to make the long and dangerous overland crossing from Murray Maxwell Bay, across Cockburn land, to Milne Inlet. But for his skill with the rifle and never-say-die determination to win through, he and his Eskimos companions would certainly have perished. A perusal of Mr. Tremblay's own narrative, which appears in chapters, III, IV, V, VI, VIII, IX, X and XI will give the reader a vivid account of what he went through and of the difficulties and dangers that have to be endured by those employed in exploring, trapping or prospecting in the glacial regions of the north.

Few men, I venture to think, would have set out so light heartedly in the depth of an Arctic winter, as did Mr. Tremblay, with only a young Eskimo and his girl wife for his sole companions, on a journey that involved so much hardship and suffering, over an unmapped route with practically no provisions. Mr. Tremblay's voyage was undertaken, perhaps without the eclat and brilliant auspices that generally attach to Government or Polar expeditions, but the distance that he actually travelled—through storm, blizard and darkness over the most treacherous and deep-drifted barrens with the thermometer ranging steadily between 10° and 57° below zero with raw frozen walrus, seal and caribou meat, generally putrid, for his sole nourishment—was four times greater than that travelled by Peary from his ship to the Pole and back. Peary was supported during his 816 miles dash from land to Pole and back by seven capable assistants, 19 Eskimos, 140 dogs and 28 sledges, the latter well-packed with an abundant supply of pemmican, tea, biscuits, condensed milk and oil fuel. Peary travelled mostly over favourable ice, in clear spring weather, for 53 days. Tremblay travelled for

156 days over equally dangerous ice and some 300 miles of unexplored land covered deep with snow-drifts, in the depth of winter, having to build his own snow-igloo every night at the end of the day's march and often going two and three days without food or fire and depending entirely, with an unsufficient cartridge supply, upon his rifle to bring down a flying caribou at long range or a diving seal to provide himself with food. Much of the time he was as far from help or a base of supplies as was Peary when at the Pole. No disparagement of Peary's wonderful achievement is intended by this comparison; but Peary's risk of being cut off from the land by the opening of leads' in the ice-floes, was counterbalanced by Tremblay's constant risk of failure of cartridge supply, and consequently of food. If anything taking all the circumstances of both cases into consideration, the greater risk was Tremblay's.

While Tremblay was making his various exploration trips to the south, I spent the time in prospecting and exploration trapping from shack and igloo round Salmon River and Bylot island and in collecting a vocabulary of the dialect of the Baffin Land Eskimos. The latter was by no means an easy task as the Eskimo is handier with his harpoon than he is with synonyms; but it completes the chain of Eskimo vocabularies; as Tyrrell made a short vocabulary of the West Coast of Hudson Bay natives; and the British Admiralty, as a result of the collections made by Parry, Dr. Richardson and the Moravian Missionaries of Labrador, published for the benefit of British Arctic expeditions, vocabularies of the Labrador, Melville Peninsula, and Kotzebue (Alaska), Eskimo dialects. The vocabularies of three of these five dialects are included in this volume, so that, no matter where the Arctic traveller of the future may find, himself, with the choice of these vocabularies at hand, he should have no difficulty in making himslef understood by the Eskimos or in communicating to them his wants and necessities.

I also prepared the accompanying map of Cockburn Land, Fury and Hecla Strait, Melville Peninsula, and Eclipse Sound in accordance with Mr. Tremblay's notes and pencil sketches and from my own notes and observations of Eclipse Sound.

In compiling the volume I have endeavoured to give, in condensed form, only the most authentic information based on reliable authorities with the object that with this book in hand, navigators, prospectors, explorers, sportmen and tourists generally will be enabled to find at a moment's notice accurate information as to the fauna, geology, economic minerals, ice-movements, currents, tides, seasons and historical data of any particular region dealt with.

A faithful description of that most interesting and deserving people—the Eskimos—their customs, beliefs and superstitions, will be found in chapter VI, and full accounts of the different animals, fishes and birds, including whales and the whale fishery, have been Scattared in appropriate chapters, throughout this book.

A full discussion of *Polar Tides* will be found on pages 408, Chapter XIV. The subject of *Undiscovered Lands in the Arctic* is dealt with on pages 435, Chapter XIV. A description of the *Pole Star* and other *Constellations* will be found on pages 284, of Chapter XII. The phenomena of the *Aurora Borealis* and other Arctic Phenomena, as described by Parry, Franklin and Peary are described on pages 160, Chapter VII. An authentic summary of the *Geological Conditions and History*, taken from the official records of the different geologists who have explored these regions, and an interesting statement of the Theory of the *Change of Poles*, and its possible explanation of the partial glaciation of the Earth's surface at different periods of time, will be found in the last section of Chapter XIV.

The location of the *Magnetic Pole*, as described by Lieut, James Clark Ross, the first discoverer; the *Variations of the Compass.* the *History of the Compass and Sextant*, the *Rules of the Road at Sea*, and a full description of the *Equipment* necessary for an Arctic Expedition, will be found in the last Chapter.

A. B. READER.

TABLE OF CONTENTS

Dedication III
Foreword V
Preface VII
Contents XV
List of Illustration XVII

Chapter I.—*Voyage from Quebec to Pond's Inlet; North Baffin Land.*—Whales and Whale Hunting.—Ice-floes and "Middle-Pack" in Baffin Bay.—Navigation of East Coast of Baffin Land.—Pond's Inlet 1

Chapter II.—*Trading, trapping and prospecting with the Eskimos of North Baffin Land.*—Narwhale.—Killer.—Gold.—Salmon and Trout. — Arctic Birds. — Coal. — Copper, — Arctic. — Fox. — Salmon River.—Expeditions and Occupations 27

Chapter III.—*Tremblay's trip to Arctic Bay* 51

Chapter IV.—*Arctic Bay and Admiralty Sound.*—Winter and Arctic Bay.—Admiralty Sound.—Borden Peninsula.—Prince Regent's Inlet.—White Whales.—Bear Hunt.—The Polar Bear.—Eskimo and Caribou trails.—The Musk "Ox" 69

Chapiter V.—*Tremblay's trip to Scheming.*—Scheming.—Seal Hunting.—The Seal 87

Chapter VI—*Tremblay's trip, Scheming to Igloolik.*—The Eskimos.—The Arctic Caribou.—Lapland and Siberian Reindeer.—Caribou Valley.—Gifford River 107

Chapter VII.—*Igloolik.*—*Aurora Borealis.*—Parry's Voyage (1822-23) 155

Chapter VIII.—*Tremblay's trip to Aggo through Fury and Hecla Strait.*—The Walrus.—A Walrus Hunt.—A hard trip.—Aggo.—Return Journey 175

Chapter IX.—*Tremblay's trip to Melville Peninsula.*—Rock-Formation —Lake Taseonia.—Lake Sarcpa.—Connaught Mountains.—Barrow Falls.—A Perilous Journey.—The Wolverene.... 199

Chapter X.—*Tremblay's trip across Cockburn Land.*—Leave Igloolik. —New Geography.—The Arctic Wolf.—Hard Travelling and Soft Snow.—Eskimo Tragedies.—More Topography.—Reach Pond's Inlet.. 217

Chapter XI.—*Tremblay's trip round Eclipse Sound and Navy Board. Inlet.*—Navy Board.—Tremblay Sound.—Milne Inlet.—Arctic Sound.—The Arctic Weasel.—The Lemming.—Halcy on days at Salmon River.. 239

Chapter XII.—*Return Voyage—Pond's Inlet to Quebec.*—Icebergs. Damage to Shipping.—Perils of Newfoundland Sealers.—Belle Isle Strait.—First Discovery of Newfoundland.—Navigation in the St. Lawrence.—Civilization once more.................. 265

Chapter XIII.—*Hudson Bay.*—Description.—Cambro.—Silurian Sea. —Ice.—Currents.—Navigation.—Storms.—Glacial Phenomena —Climate.—Resources.—History.—Hudson Bay Company.— —Baffin Land.—Southampton Island.—North-West Coast. Hudson Strait.—West Coast.—East Coast.—James Bay.— Ungava Bay and Labrador........................... 295

Chapter XIV.—*Historical Summary of Arctic and Polar Exploration.*— The North-West Passage.—The Search for Franklin.—The future of the Arctics.—Canadian Expeditions.—Smith Sound and Polar Research.—The North Pole.—Geoligical Summary. 365

Chapter XV.—*Meteoroligical Notes and Arctic Outfit.—Eskimo Vocabularies.*—Labrador.—Melville Peninsula.—Kotzebue Sound (Alaska) Baffin Land (Pond's Inlet) and West Coast of Hudson Bay.. 511

TABLE OF ILLUSTRATIONS

The "Minnie Maud" i
Mr. Alfred Tremblay, Arctic Explorer and Veteran of the Great War i
Captain Bernier, Commander of several Arctic Expeditions and Commanding Officer of the "Minnie Maud" ....
Mr. A. B. Reader vii
Peewiktoo and Tootillik my faithful compaions 1
"Arctic" leaving Quebec, July 7th, 1910 4
The Arctic with a good breeze 5
Steam Whaler, Port Saunder, Whaling 10
Capt. L. Anderson, killing a whale of Bonne Espérance Bay 11
Greenland iceberg 14
Iceberg in Baffin Bay 15
The first Eskimos we met, July 1910 22
The Pond's Inlet, Eskimos at Button Point 23
Port Albert 24
Peak King George, Pond Inlet, August 1st, 1910 25
Narwhale killed in Admiralty Inlet 28
1—Arctic White Fox 29
2—The Arctic Wolf 29
1—Pond's Inlet Village 32
2—The "Minnie Maud" in winter quarter at Albert Harbour 32
1—Salmon River 33
2—Fishing salmon a net at Salmon River 33
Alfred Tremblay 52
The Eskimos of Arctic Bay, September 13th, 1910 53
Iceberg in Lancaster Strait 56
Adam Sound 57
1—SS. "Arctic" heading North for the Winter, Arctic Bay, Oct. 1910 70
2—"Arctic" at1 a. m., July 1910 70
3—Ice anchor from Capt. W. E Parry, 1822-23, discoverer at Igloolik by Alfred Tremblay, March 1913 70
1—Eskimos deserted village Adam Sound 71
2—Snow Igloo, Arctic Bay village 71
1—Cape Riley, North Devon 72
2—Rugged Cliffs, north side of Adams Sound 72
Drying Seal skins, March 1911 73
1—Admiralty Inlet, West of Arctic Bay 74
2—Pond's Inlet Coast 74
3—Ice pressure Baffin Island Coast 74
Cape Rotunda, Adam Sound, 1919 75
First Polar Bear killed by Alfred Tremblay 78
1—Musk-ox in Melleville Island 79

2—Second Polar Bear killed by Alfred Tremblay.................. 79
3—Return Reindeer hunting trip.......................... 79
Polar Bear killed by Capt. Bernier.......................... 80
Musk-ox head.......................... 81
Base of Cross, Arctic Bay.......................... 84
Seal Hunting Apparatus.......................... 85
Arctic Caleche, June 23rd, 1911.......................... 88
Eskimos party on Admiralty Inlet, October 1910.................. 89
Iceberg, Admiralty Inlet, August 1911.......................... 94
The Eskimos dogs.......................... 95
A good team of Eskimos dogs.......................... 96
Eskimos Sledges.......................... 97
A big Arctic Seal.......................... 104
The Scheming Eskimos.......................... 105
1—A troop of Arctic Reindeer.......................... 142
2—The Walrus.......................... 142
3—The Arctic Blue Fox.......................... 142
4—A Polar Bear swimming.......................... 142
Igloolik Eskimos.......................... 143
1—Iceberg in Lancaster Strait.......................... 180
2—Cape Ross, Cornwallis Island.......................... 180
Beechy Island.......................... 180
Barrow Strait ice.......................... 181
1—Hunting Polar Bear with Dogs.......................... 201
2—The foot of a glacier.......................... 201
Sir John Franklin Memorial Tablet.......................... 233
1—Bylott Island at Midnight.......................... 241
2—Baffin Land, Midnight View.......................... 241
1—The midnight sun.......................... 249
2—Hunting Polar Bear in Kayak by the Eskimos.................. 249
Whaling Boat—Leaving for Button Point.......................... 261
Iceberg in Baffin Sea.......................... 270
Iceberg in Baffin Bay.......................... 271
Baffin Sea Iceberg.......................... 311
Iceberg from Groenland Coast.......................... 371

MAPS

North Baffin Land and Melville Peninsula.......................... 574
The Arctic Islands.......................... 574

Peewiktoo and Tootillik my faithful companions

CRUISE OF THE MINNIE MAUD

CHAPTER I

VOYAGE FROM QUEBEC TO POND'S INLET

The Minnie Maud.—When the news appeared in the Press that two well equiped expeditions had already sailed in 1912 for the new Eldorado that was reported to exist in North Baffin Land, the old mackerel shooner Minnie Maud was purchased and hastily fitted out for what was expected to be a two year sojourn in the Arctic islands. The schooner 85 feet long, 22 feet wide with a draught of 9 feet aft, was docked, overhauled and fitted with a thin sheating of steel plates, six feet below the water line, as a protection against the assaults of the ice-floes. The schooner was twenty years old and her ribs of seven inch spruce and three inch oak planking, did not offer much security in the event of the pressure from the grinding ice-floes, nor did they compare very favorably with the 18 inch wooden walls of the C. G. S. Arctic, built of the finest oak greenheart and pitchpine.

The Minnie Maud proved herself however to be a fast sailer and an excellent sea-boat and her decks were dry in the roughest weather.

The cargo.—The cargo consisted of the usual assortment of barrels of hard tack, biscuits, pork, beef, molasses, beans, salt, sugar, etc., and also tobacco, cartridges, matches, needles, beans, knives, harpoon, steel clothing and other requisities to be used in trading with the Eskimos. Lumber for building sheds; gazoline for the two gazoline engines that were fitted in two large boats carried on deck; and an assortment of rifles, drill steel, blasting powder, hammers, picks, shovels, and pans for prospecting purposes also formed part of the equipment.

The party.—The members of the party were Messrs J. E. Bernier, Captain; N. Chassé, William and John LeBel, W. Caron, G. Wilson, G. Lawson, Alfred Tremblay, and A. B. Reader, all hailing from Canada although Messrs Lawson and Wilson originally came from England and M. Reader was from New Zealand. Five of the party had had previous experience in the frozen North; having accompanied the Canadian Goverment ship Arctic in her various expeditions, to take possession of the northern islands for Canada.

Departure from Quebec.—The schooner was towed out of the Louise Basin at Quebec, at five o'clock in the afternoon of July 29th, 1912, amid the cheers and friendly shouts of *Bon Voyage* from the crowd of the dock. She anchored outside until midnight and then set sail for l'Islet, where she arrived the next day and where some pleasant hours were spent ashore. The next day we sailed down the river to Kamouraska and the weather being rainy, sou'westers and oilskins were served out. At Kamouraska, Messrs Chassé, Wilson and Lawson joined the party and we continued down the river, amid, rain, calms and fogs until Pointe-des-Monts was reached early on August 3rd. Pointe-des-Monts is the meeting place of the fresh waters of the St. Lawrence with the salt waters of the Gulf and is the site of the most imposing lighthouse. Here we anchored for a few hours and had a pleasant visit with the Fafard family despactching our last letters and telegrams; as Pointe-des-Monts was to be our last point of contact with civilization for the next fourteen months.

Pointe-des-Monts.—We left Pointe-des-Monts at 2 p. m. and as we ran rapidly away before an eight-knot westerly breeze, we received a parting salute of two guns which were fired from the lighthouse and which we acknowledged by dipping an ensign.

Gulf of St. Lawrence.—The next five days were spent in boating our way along the north coast of Anticosti and along the north shore of the Gulf of St. Lawrence, encountering light breezes from the south-east, dead-calms, fogs, and sometimes drizzling rains. The watches were set and our days occupied in cleaning ship, refitting ropes, painting boats, sharpening axes and tools, lashing the cumbrous water-casks and boats to the deck and getting everything shipshape in anticipation of the rough weather that were bound to encounter when crossing the North Atlantic.

Watches.—The starboard watch consisted of Messrs Bernier, (Captain), Chassé, Reader, John LeBel. In the Port watch were Messrs Caron (Mate), William LeBel, Tremblay and Wilson. Lawson acted as cook.

Marie Romkey.—On August 8th, we had an interesting brush with a fast sailing schooner the "Marie-Romkey" which came swooping down on us with all sail set from behind some islands and challanged us to a race. After an hour contest the breeze felt and we lost her astern in the fog.

Belle-Isle strait.—On August 10th, the massive blue mountains of Newfoundland came into view of our starboard bow, and we entered the strait of Belle-Isle at five p. m., running nine knots an hour before a strong westerly wind. We passed a large steamer the "Saturnias", inward bound, and made our first acquaintance with ice in the shape of two large icebergs which were apparently aground on the Newfoundland coast. The fog then descended and we ran thro a field of broken ice, evidently fragments of some big bergs in the vicinity. As the fog grew denser we shortened sail for a couple of hours, when we hoisted the reef mainsail in the hope of quickly clearing the dangers of the narrow straits, and gaining the open sea. Suddenly two huge gastly yellow bergs loomed up through the fog a few hundred feet away from the port bow, so we dropped the mainsail and hove to "à la cap" under foretop staysail and reefed mizzen all night, which was cold and wet with a strong west wind blowing and accompanied by a cold drizzling rain and dence fog. It was anxioux work at the look-out as icebergs were all around, the shore was close and we ran constantly, risk of either colliding with an iceberg, of running on shore or being run down by a steamer, in the fog. The foghorn was kept going and soundings were taken every hour, as we were in ignorance as to our exact position and the straits are only from 8 to 10 miles wide, with strong currents running. All hands were glad when themorning broke at 3 a.m. August 11th., and wind and sea abated altho the fog still continued dense. Soundings were taken and we got 70 and 75 fathoms. At 8 a. m. we hoisted sail and made an easterly course passing an iceberg to starboard at 1 p. m. Hoisting more sail we ran before a steady S. W. breeze for the open sea. At 2 p. m. the fog lifted and the sun shone out overhead, and for the first time in twenty hours we saw land astern of us which proved to be Belle-Isle.

The Broad Atlantic.—We had run the seventy miles of narrow straits thro dense fog without once catching a glimpse of land on either side. The afternoon was perfect with the sun warm and bright in a blue sky and a nice six knot breeze wafted us along E. N. E. towards Greenland. It was an agreable contrast with the miserable weather we had left behind us in the straits. We counted fifteen bergs, gleaming white in the sunlight, on either side and behind us, dense clouds of white fog covered the dangerous straits and coasts as with a shroud. The breeze freshened towards evening and hoisting our jib-topsail we bowled along all night at a nine knot clip over the broad Atlantic. The night was thick with fog and drizzling rain and a double lookout was posted on the forecastle to watch for icebergs. It was anxious work, at night on the look-out, with the ship tearing and plunging over the waves at 9 or 10 knots an hour, before a cold wind through dense fog and rain-squalls. Every moment we expected to see the cruel yellowish glare of a monster berg loom up out of the fog at the end of the bowsprit, and the white phosphorescent patches of foam, caused by breaking waves, kept us in a state of constant anxiety as whether it was ice or water, as one sharp blow from a floating fragment of ice, not to mention an iceberg, would have sufficed to send the whole ship's crew to the bottom. After four hours spent on the lookout under these conditions we were glad to go below and forget our anxieties in sleep, if the rolling and the pitching of the vessel, the creaking and groaning of the timbers and the roaring swirl of wind and waves would permit.

A Narrow Escape.—Next morning at 7.30 a. m. we found ourselves flying before the wind strait for a huge greenish yellow berg which sprang up like a mountain out of the fog. The man on the look-out gave a shout, the helm was thrown over and we passed by within a few hundred feet to starboard of the monster, whilst visions of the ill-fated "Titanic" rose before our eyes. We ran fast all the morning through dense fog and rain, when the wind shifted and fell, leaving the ship rolling and straining her masts and boom in the heavy swell. At 4 p.m. the wind began to freshen from the N. W., the fog lifted, the sun shone out of a beautiful clear evening sky and there was no ice in sight. Early next morning, August 13th, the wind became very unsteady, shifting from N. W. to S. W. and then N. E. and caused the schooner to pitch and roll in a lumpy cross-sea, which made several members of the party sea-sick and made it difficult to steer and hold the wheel steady. At 3 p.m. the wind suddenly sprang up from the S. W. and setting all sail we sped along once more for Greenland. At noon we were in lat. 55–43 N and long. 54–, about 300 miles from Cape Farewell the most southerly cape of Greenland. The wind had boxed the compass during the last 24 hours, as this action of the atmosphere, as we proved on several subsequent, occasions generally presages the occurence of a gale of two or three days duration, when the wind settled down to blow from a regular quarter.

We ran before the S. E. breeze all night at an 8 knot clip, the shooner riding the heavy swell like a sea-bird and proved herself to be very dry and steady in a sea-way. That night the deck was covered with a heavy dew, betokening the continuance of the southerly wind. The nights were getting longer as we approached the Arctic Circle, daylight appearing at 2 a.m. and the sun setting at about 2 o'clock at night.

Southerly Gale.—At noon, August 14th, we were in lat. 57-47′ having logged 126 knots in the past 24 hours In the afternoon the wind increased in strength and we madge 60 miles or one degree of latitude, on our course, from noon till 6 p. m. an average of ten miles an hour. In the evening we took in headsails and reefed the huge mainsail, the schooner ran nearly 12 miles an hour through the night, making 47¾ miles between midnight and 4 a.m. We had the benefit of the southerly current with us, which flows up

"Arctic" leaving Quebec, July 7th 1910.

The Arctic with a good breeze

the west coast of Greenland. At midnight all hands took in the mainsail and jibs as the wind and sea were increasing in strength and violence, and there was danger of the great 57 foot mainbow-jibing and tearing away the mainmast. On August 15th, we were in latitude 61–.43′ and long. 54 W. having reeled off 216 nautical miles in the last 24 hours The wind blew with terrific force from the south all day accompanied by a mountainous following sea which on several occasions threatened to poop and engulf the schooner. The helmsman was lashed to the bitts to prevent his being washed overboard, and the schooner under double-reefed mizzen and foresail sped 10 knots an hour before the gale. In the afternoon a heavy sea struck the poop, flooded the after-cabin, and the cold wind and drifting rain wet and chilled us to the bone. In the evening both wind and sea moderated and at midnight we shook out the reef in the mizzen and hoisted the main-jib Four oclock next morning, August 16th, we hoisted the main-sail gaft and jib top-sail and by noon were in latitude 64–.3′ having logged 175 miles since noon the day before.

The Greenland Coast —We bowled along all day at a 7 knot clip under full sail and caught our first glimpse of the Greenland coast at 5 p. m. As we neared the land the magnificent panorama of the Isortok Range came into view, the snowy peaks standing out against the clear sky in all their rugged grandeur. These mountains which rise to a height of 4,000 feet are very grand and inspiring, and gave us a pleasurable sense of being once more in the neighbourhood of land and human beings, as the fiords are inhabited by Danish settlements.

A Perfect Night.—That night was a perfect one. The sky was filled with a golden-pink twilight and the schooner glided gently over a greenish-silvery ambient swell. To our right the majestic snow-capped peaks of Isortok stood out, clear cut and rugged, against the clear atmosphere. The perfect stillness and repose of the night was broken only by the occasional creaking of the cordage and spars, the reepling of the reef points against the sails, as the breeze rose and died away; or the lazy swish of the swell against the ship's sides, or the subdued croak of a sea-bird, or the distant "woof" of a narwhal coming to the surface to blow. It was an ideal night and, when the watch on deck was ended, one descended into the stuffy foc'sle with a feeling of regret. At midnight the breeze collapsed entirely and the ship rose and felt lazily on the oily swell.

Halibut Bank —In latitude 64–N, there is a fine halibut bank situated about thirty miles from the Greenland coast, which extends for many miles to the northward. It is called the Hallebank, and is favorite feeding ground for halibut. The depth of waters on the banks varies from 15 to 20 fathoms, and icebergs from Melville Bay and Greenland are often seen aground on its outer edge.

The whaling ships have fished there for years catching halibut for their own use, and several American schooners formerly visited the Hallebank for the Boston market.

In the evening of August 17th, we sighted six whales "blowing" on the port side, the weather being calm and mild as a summer's day with a heavy dew falling at night on the deck. The next day (Sunday) was a beautiful, bright, clear, calm day and in the evening we indulged in a gramophone concert in the after-cabin, enjoying at second hand the songs and wit of favourite artists. At night whales kept blowing near the ship. At midnight we saw the lights of a steam vessel approaching us from the north and although she veered in as to inspect us, no hail was given and she passed on. We presumed her to be a Danish Government Coastguard Ship, as no foreign vessels are allowed to trade or even to land on the Greenland coast without the previous permission of the Danish authorities.

A Dead Whale—August 19th, was calm with a light drizzling rain falling and we made slow progress. Large icebergs were on either side of us. In the evening under a 4 knot breeze we drew near the island of Disko, and ran the schooner along side the carcasse of an enormous dead Greenland whale which we had noticed floating in the water for sometime before reaching it. The dead whale was about 65 feet long and belonged to the Bowhead, Greenland or Right species. It had evidently been killed by a thrust from a harpoon or by a giant swordfish, as there was a large wound in its exposed side. Its entrails were floating along side in the water and the stench was abominable. Crowds of screaming gulls were pecking away on its back and dozen of wicked-looking dogfish or Greenland sharks, were swimming around the floating carcase and tearing away chunks of hide and blubber from the submerged portion. As the whalebone in its huge upper jaw was only three feet in length, we did not bother to cut it away.

Greenland or Right Whale.—The Right whale has become very scarce in recent years, owing to the persistent manner in which it has been hunted and killed by Scotch, American and Norwegian whalers during the past 50 years. In the height of the whaling industry there were from 600 to 630 whaling vessels, in active service, in the Atlantic, Pacific and Arctic Oceans, hailing mostly from the United States and British Ports; now the number scarcely reaches 50, and the Scottish whalers have in the last few years, entirely abandoned whaling in Baffin Bay and Greenland waters. In two consecutive summers, 1906 and 1907, patroling the northern waters, the "Arctic" only sighted one whale after cruising in Ponds' Inlet, Barrow Strait, Navy Board-Inlet, Admiralty Sound, Prince Regent Inlet, Peel Sound, Austin Channel, Melville Sound, Jones Sound, Baffin Bay and Cumber and Gulf. There can be no revival of the whaling industry until there is first the renewal of the supply of whales, and that can only be procured by protection and by the establishment of a lengthly close season, during which the killing of whales is prohibited.

It was that intrepid early navigator, William Baffin, who first passed through Davis Strait and explored Baffin Bay, as far back as 1616, and who first called attention, after his return to England, to the great value of the whaling industry in Greenland waters.

During the last 45 years nearly 2,000 whales, yielding 1,000 tons of whalebone and 23,000 tons of oil, worth at current market prices about $17,000,000.00 have been captured in Baffin and Hudson Bays; with the result that the species have become so scarce that the chase no longer warrents the great expense and risk that are attached to the outfitting of vessels, manned by large crews, for the trade.

The Governments of Canada and Danemark would do well to prohibit the further killing of these valuable and highly interesting sea-mammoths for a period of 20 years, or the race will soon become as extinct as the buffalo.

Dimensions of Whalebone.—An adult whale varies from 40 to 60 feet in length, extra large ones, 65 feet, and the largest recorded measured 80 feet in length. The head measures a th rd about of the length of the body and the upper jaw, which carries the baleen or the whalebone is only a few feet shorter. The baleen occurs in the form of a thin slab or "splits" set close together in the gum at right angles to the length of the jawbone. There are about 360 of these splits on each side of the jaw. The largest recorded split measures 14 feet in length, but the ordinary length in adult whales is from 9 to 10 feet. Bone of that length will nearly average a ton to a whale and at current prices is worth $15,000.00 a ton, and the price is rising every year. Six foot bone and under brings only half the price of larger bones.

Whale Food.—The baleen in the whale's mouth acts as a sieve to entangle and collect the small animals upon which it feeds. The food of the animal consists of small crustceans (called sea-lice by the whalers) and swimming pterepods known as "whalefood" and "blackberries." These creatures in turn feed upon minute animal organism, known as diatoms, which are found in countless numbers in these northern waters, being so numerous as to discolour large areas of the sea, giving it a light-green or brownish hue. The diatoms are propagated in the fresh water pools upon the large pans of ice and they thrive best, apparently, in the comparatively fresh surface-water in the vicinity of melting ice, which would account for the whales frequenting such localities. The favorite resort of whales in northern waters is along the edge of the ice, still fast to the shore, with an abundance of loose ice outside. When the shore-ice is all melted or loosened, they remain about the edge of the large masses of floating ice. The ice gives them both food and protection against their deadly enemy the giant sworfish or killer, which pursues them relentlessly but will not enter the ice-floes.

Value and Products.—The average whale carries about a ton of whalebone, and an adult female whale will furnish blubber for nearly 30 tons of oil, the male providing about 20 tons, which is worth $100.00 a ton. The total value of a large whale varies from $15,000.00 to $20,000.00 for whalebone and oil.

The whale's body is covered with a thick skin, an inch to an inch and a half in thickness, which the Eskimos and whaling crews consider a great luxury. It is eaten boiled, a small amount of blubber being attached to give it a flavor. When cooked it has the appearence of thick black india rubber, being soft and glutinous, while it has a clam-like flavor. The flesh of the whale is coarse and tough, being used by the Eskimos mostly for dog-food. The fat or blubber, from which the whale oil is made, resembles very fat pork and varies from twelve to 18 inches in thickness, being thickest towards the tail.

Habits —Whales are gregarious, and when plentiful travel in large bands, but they are now so rare that a band of 3 or 4 is the greatest number seen together in late years

A whale is generally sighted by the column of spray, or condensed moisture from its lungs, which it throws up when breathing, and which often rises 20 feet in the air, accompanied by a hoarse puffing sound. A whale generally spouts or breaths five or six times, when it comes to the surface for that purpose, and remains up for several minutes. It then goes down to feed, remaining under water for 15 or 20 minutes, during which time it travels about a mile. When feeding, a whale travels at or near the surface, about 2 or four miles an hour. When harpooned and dragging a boat a whale rarely exceeds six miles an hour.

The Cachalot —The Cachalot or Sperm whale (P. macrocephalus L) is the largest and most massive of all animals. The head is enormous, square in shape, and the animal has no neck. The stomach is divided in 4 compartments and the intestine is 15 times the length of the body. The colour is black except the belly which is grey. The teeth of the cachalot are hard, compact and easily polished, if they were white, they would have the value of the ivory. A cachalot's tooth in the British Museum is 10 inches long, 9 inches in circumference and weights 3 lbs and a half.

Formerly the male attained a length of 100 feet and a girth of 30 feet; the female attaining only half of that size. But now they rarely exceed 60 feet in length. The cachalot is a cosmopolitan animal and is found in all warm seas, but is rarely found in the glacial seas, beyond the 66th parallel, north and south.

They pass from one sea to another, as whales that were wounded in the Pacific were afterwards killed in the Atlantic. They travel in numerous bands headed by a vigorous male that defends the females and their youngs from the attack of their ennemies. They always frequent deep water and when in flight swin as fast as the fastest sailing vessel. Their ordinary cruising gate is 3 to 4 miles an hour. The interior of the cachalot's mouth is a brilliant white for the purpose of attracting when opened, the caphaloids and other diet. The female has sometimes two, although more often one young at a time, which have a length when born, of thirteen feet.

Products Oil —The products of the cachalot are oil, spermacetis and ambergris. The oil is of an excellent quality and a single whale will produce from 80 to 100 barrels

Spermaceti.—The spermaceti (palmitate of cetile or palmetic ether)is a liquid fat, faintly odoriferous, which is found in a cavity on the top of the skull and just behind the nazal ducts. When petrified in a weak solution of caustic potash and boiling water the spermaceti is cooled and made into cakes of 40 or 50 lbs weight, pommades and cold cream. In 1831, 7,600 tons of spermaceti were collected, but since then the supply has greatly diminished.

Ambergris.—The ambergris are found in the beaks of caphaloids shell and spikes of fishes that have been swallowed by the whale. The ambergris is generally found floating on the surface of the broad ocean in a void, irregular mass that weighs two pounds or over. It is also found deposited on the coast of Madagascar, Japan, Brazil and the Antilles. Ambergris is used in perfumery and the making of the oriental pastilles. Thirty years ago, ambergris was worth $400.00 per pound, but owing to its great scarcity it is worth much more now.

The pursuit of the cachalot is costly, uncertain and highly dangerous as the animal is, when attacked, both fierce and courageous. When harpooned, it makes furious rushes at the whaleboats, which it has often succeeded in wrecking with its ponderous head or terrible flukes. The whaling ship "Waterloo" many years ago was rammed and sunk by a wounded cachalot in the North Sea. One of the most fascinating stories is Bullen's "Cruise of the Cachalot," which gives a stirring account of the pursuit of this formidable marine monster.

Swordfish and Killers vs Cachalot.—Bullen writes:—"When a sperm whale is in health, nothing that inhabits the sea has any chance with him; neither does he scrupule to carry the war in the ennemy's country since all is fish that comes to his net, and a shark 15 feet in length has been found in the stomach of a "cachalot."

"I once saw a combat between a bull-cachalot and so powerful a combination of ennemies, that even one knowing the fighting qualities of the sperm whale, would have hesitated to back him to win. Two "Killers' and a sword-fish, all of the largest size, inspired no doubt against their usual practice of leaving the cachalot alone had come to an evident understanding to attack the giant and solitary bull. Upon this memorable occasion, however, I guess the two Orcas were starving and they had organized a sort of foreom hope with the Xiphias as an auxiliary who might be relied upon to ensure success if it could be done. Anyhow, the syndicate led off with their main force first; for while the two killers hung on the cachalot's flanks diverting his attention, the sword-fish, a giant some 16 feet long, launched himself at the most vulnerable part of the male whale, for all the world like a Whitehead torpedo. The wary eye of the whale saw the long dark mass coming, and, like a practised pugilist, cooley swerved, taking for the nonce no notice of those worrying wolves astern. The shock came; but instead of the sword penetrating three, or may be four feet just where the neck encloses the huge heart, it met the mighty impenetrable mass of the head, solid as a block of 30 tons of india rubber.

"So the blow glanced, revealing a white streak running diagonaly across the eye while the great Xiphias rolled helplessly over the top of that black bastion. With a motion so rapid that the eye could scarcely follow it, the whale turned settling withal, and, catching the momentarily motionless agressor in the lethal sweep off those awful shears, crunched him in two halves, which writhing sections he swallowed seriatim And the allied forces aft, what of them? Well they had been rash they fully realized that fact, and would have fled, but one certainty found that he had lingered on the scene too long. The thouroughly-roused leviathan with a reversal of his huge bulk that made the sea boil like a pot, brandished his tail aloft and brought it down upon the doomed "killer," making him at once the "killed." He was crushed like a shrimp under one's heel

"The survivor fled—never faster—for an avalanche of living furious flesh was behind him, and coming with enormous leaps half out of the sea every time. Thus they disapeared, but I have no doubt as to the issue. Of one thing, I am certain, if any of the trio survived, they never afterwards attempted to rush a cachalot".

Whale Hunter.—A correspondant of the "Quebec Chronicle," gives the following graphic description of the present day methods of hunting and preparing whales for market:

"With the perfection of the harpoon-gun, invented by Svent Foyn, a Norwegian, began a new area in the history of whaling This invention has made possible the capture, in tremendous numbers of the fin whales, animals which had been little troubled by the men who hunted in a small boat with a hand harpoon and lance, because their great speed and tendency to sink when dead, as well as their thin blubber and short coarse, "whalebone" or baleen, made them difficult and unprofitable to kill.

Steam Whaler, Port Saunder, Whaling.

Capt. L. Anderson, killing a whale of Bonne Esperance Bay.

"Svend Foyd discovered that by mounting a small cannon, which shot a heavy harpoon, upon the bow of a small iron steamer, the fin whales could be killed in sufficient numbers to warrent the erection of stations at certain places upon the shore near the feeding grounds of the animals, where the huge carcasses could be hawled out of the water by means of a steam winch and converted into commercial products. These short stations proved so immensely profitable, that within a few years, they had been erected in almost every part of the world where conditions were favorable —in Newfoundland and Labrador, Alaska, British Columbia, Washington, Oregon, Mexico South America and the islands of the Antartic; on the coast of Japan, Corea, Africa and Russia. Australia has recently been invaded; in New Zealand humpback whales are being taken in wire nets, and some in every part of the globe the world hunt goes on. But it is from the stations of the South Atlantic islands that the greatest fortunes are being made today.

The Harpoon Gun.—"It was only after years of experimenting that the harpoon gun of the present time was evolved. This is a short, heavy cannon 51½ inches long, with a three inch bore, and is mounted upon a swivel, which works easily up and down and from side to side. At the butt end a short wooden handle projects, under which is an iron lever, the trigger. The charge is of 300 or 375 drams of very coarse black powder, which is sewed up in a cheese cloth sack and rammed in from the muzzle, then comes a ward of oakum, hard rubber or cork and wool, after which the harpoon well grasped is pushed in and hammered solidly into place with a wooden mallet.

"The harpoon is 76 inches in length and has a double shaft, at the end of which is a four twelve-inch flukes or barbs; these spread and prevent the iron from drawing out of the whale's body. The tip of the harpoon is a hallow point, called the "bomb" which is filled with powder and ignited by a time fuse; three or four seconds after the discharge of the gun, the bomb bursts, killing the whale almost instantly.

Whaling Steamers—"The whaling steamers are trim, high-bowed vessels of about 100 tons burden, 90 to 100 feet long, and have a speed of from 9 to 12 knots (10 to 14 miles an hour). Round-bottomed, to facilitate speedy manipulation, they ride the water like a cork, but roll and pitch tremendously in the lightest sea way.

Attacking a Whale.—"As soon as a whale is sighted at sea the vessel is headed at full speed straight for it. When close by some captains will "lie to" with engines stopped, waiting for the animal to rise again, while others prefer to steam slowly in a wide circle about the spot where the whale went down. If the animal rises near enough for a shot, the gunner waits until the maximum amount of its body is shown above the water, and usually fires just as the dorsal fin appearing above the surface.

"Often the harpoon will be driven into the flesh for its entire length and, in fact, in one instance, when I saw a small finback whale killed, it went completely through the body. If the iron penetrates the thoracic cavity and the bomb explodes near the heart or lungs, the animal is killed instantly. Often however, two harpoons are required to finish the work and in rare instances three or four.

Treatment of Dead Whale.—"As soon as the whale is dead, the body sinks and must be raised by means of the steam winch. When it is at the surface, a leaded rope is thrown under the "flukes" or tail, a chain drawn about them by means of it, and the carcass made fast; flukes foremost, to the bow of the vessel. Immediately a coil of small rubber hose is prepared, one end of it is attached to the air pumps and the other to the hollow spear pointed tube of steel, with perforations along its entire length. This is jabbed well down into the stomach, the pumps started and the body slowly filled with air. When it has been inflated sufficiently to keep it afloat, the tube is withdrawn and the incision plugged with oakum.

Towing Carcasse Home.—"If the whale has been killed early in the day, or there are others nearby, the carcass will usually be marked with a flag and set adrift to be picked up at the end of the day's hunting. Several times I have been on board ship when as many as six whales have been killed in a single day, and it meant a long, slow tow back to the station even for the powerful little steamer.

Flensign.—"I will never forget my intense surprise at the extra ordinary care and quickness,with which the enormous carcasses are handled by means of the steam winch, when I first saw whales "cut in." Three humbacks had been left floating in the water, tied to the end of the long inclined platform called the "slip." When work began, a heavy wire cable was made fast to one of the whales, just in front of the flukes, the winch started and the carcass, weighing perhaps 45 tons, drawn slowly out of the water upon the slip. One of the cutters scrambled up the whale's side, balancing himself upon the smooth surface by the aid of his long knife, made his way forward to sever at the "elbow" the great side fin, orflipper, 16 feet in length.

"Before the carcass was half out of the water other cutters or "flensers," as they are called, had begun to make longitudinal incisions through the blubber along the breast, side and back, and from the flukes the entire length of the body to the head. The wire cable was then made fast to the blubber at the chin; the winch started and the great layer of fat stripped off exactly as one would peal an orange. When the upper side had been denuded of its blubber covering, the whale was turned over by means of the canting winch and the other surface fleeced in the same manner.

Extracting Oil.—"Both flesh and bones were piled separately into great open vats which border the carcass platform, and boiled to extract the oil. The flesh was then artificially dried and sifted, thus being converted into fine guano; and the bones are pulverized to form "bone meal," also a fertilizer. Even the blood of which there are several tons on a large whale, was carefully drained from the slip into throughs, boiled, dried, and converted into fertilizer. Finally, the water in which the blubber had been dried out, was used in the manufacture of glue."

"Few people realize that whale flesh supplies the greatest part of the meat diet of the ordinary Japanese. It is prepared in a variety of ways, but perhaps is most frequently chopped finely mixed with vegetables and eaten, dressed with brown sauce. Almost every part of the great carcass is utilized for human consumption, even the tendons, heart, livers and intestines being prized by the cooks.

Commercial Value.—"In American and other countries, the commercial value of whales depend entirely upon how thoroughly the by-products are utilized. If only the oil is taken, a blue whale may be worth little over $200.00, but if the entire carcass is worked up, it may bring $1,000.00 or $1,500.00, according to the price and guano."

Disko.—After leaving the dead whale we approached the island of Disko as night fell and, a very cold N. E. wind springing up, we were obliged to tack ship every hour during the night. Next morning (August 20th) which was bright and clear, a strong head wind and sea from the N. E. obliged us to tack ship all day. We had a good view of Disko Island. The coast-line of the island consists of highhead yellowish sandstone cliffs, 2,000 feet high, and at this time, quite bare of snow. A long fiord, penetrates the centre of the island from the west side and affords first rate shelter and anchorage for ships. There are large and valuable deposits of coal on the west side. The scenery of the island is very grand; the shortline is deeply indented by narrow bays, from which the land rises abruptly into irregular mountain masses, terminating in sharp peaks, whose loftier summits were hidden in a straight line of clouds formed from recently rising fogs. All the higher valleys were filled with great glaciers pouring slowly into the sea, which was dotted with fantastic icebergs. The contrast between the dark sombre rocks of the hills and the dazzling whiteness of the glaciers, was enhanced by the streams of sunlight which flooded the .interior, while the coast was veiled by the fog clouds.

Dangers of Icebergs.—August, 21st, was calm and the ship rolled idly on the swell, with sails flapping and booms jerking and straining with every roll. At one time it looked as if nothing could save us from drifting on the ram-shiped bow of a huge iceberg, that lay unpleasantly close by to the schooner. At mid-day a N. W. breeze sprang and we were glad to escape from the vicinity of the dangerous berg. A ship should never approach too close to an iceberg, as the latter is liable, without a moment's warning, to break into fragments or roll completely over. The steamship "Miranda" from St. Johns' Newfoundland, paid the penalty for her curiosity some years ago. Laden with passengers, and wishing to satisfy their curiosity, the captain run the vessel alongside an iceberg in o rder to examine it at close range. The giant berg broke and a fragment fell on the ship, breaking in her plates. At the same time the berg rolled and lifted the ship clean out of the water on a projecting bench of ice, with the result that the vessel had to be abandoned and the passengers saved into boats.

It is a grand and awesome sight when a huge iceberg, weighing perhaps several millions of tons, calves or breaks into several pieces, rolling completely over with a thunderous roar and rumble, and raising a wave large enough to swamp a ship.

Owing to calm and contrary breezes we did not lose sight of Disko Island until the evening of August the 22nd, and we often lamented the absence of an auxiliary engine to help us on our way. Enforced inaction through calms and head winds becomes very monotonous and disperiting, especially when one is cooped up on the deck of a small vessel. When off Hare Island, north of Disko, we sighted over 40 icebergs, large ones, 30 of which were aground. These bergs would not reach the Atlantic until next year, as they travel with the current about 500 miles a year.

In these northern waters, hazy and foggy weather require ceaseless care and constant look-out on the part of the officers and the crew of a vessel, as icebergs and "growlers" are everywhere and constitute an ever present menace and danger espacially in heavy winds.

Melville Bay.—About 120 miles north of Disko, extending for a distance of 480 miles from Svarton Peninsula, on the south to Cape York, on the north west, is Melville Bay; known and dreaded by whaling captains as a death-trap for ships. Melville Bay is about 90 miles deep and its coastline is only partially surveyed. The shore line consists of an almost broken line of glaciers which constantly discharge large icebergs into the waters of the bay. A large number of rocky islands break its surface and the bottom appears to be very uneven, with much shallow water; in consequence, many icebergs are grounded in the shallower parts of the bay. The islands and grounded bergs break the wind and waves and so allow the formation of heavy sheets of ice between them during the winter months, while in summer they act as anchors for this sheet of flo-ice. Every June and July, the S. W. current

Greenland Iceberg.

Iceberg in Baffin Bay.

carries a great part of the shore ice of Central Greenland to Melville Bay which adds to the ice congestion there, so that it is always late in the season before the bay is even partly clear of ice, which must pass westward until, influenced by the northern current from Smith Sound, it is deflected south and goes to increase the great floating mass of ice, known as the "middle-pack", which all summer blocks the south-western part of Baffin Bay and the sounds and bays along the east coast of Baffin Land.

In the days of whaling ships the whalers made their way across Melville Bay by "tracking" or sailing along the edge of the solid land-ice, and many a vessel was lost there. Even with steam power, Melville Bay, is a place of terror to the whalers, and they never feel safe until they have reached the "north water" of Cape York. As an illustration of the dangers and difficulties of this crossing, the "Vega" was crushed and sunk in the summer of 1903, and the "Baleana" was at the same time 80 days jammed in the ice. In 1904 the whaler "Eclipse" took 30 days to cross the bay and the "Diana" was 35 days in crossing. The "Neptune" on the August 8th, 1904, crossed the upper portion of the bay (180 miles long) in 20 hours ahead of a gale of wind accompanied by heavy rain and sleet when little ice was seen until a few miles within Cape York, and from there to Cape Alexander, at the entrance to Smith Sound, only "pan" or sheet-ice was observed at the head of the larger bays, all the eastern side of the northern part of the Baffin Bay being free of ice. The "Minnie Maud" on August 24th and 25th, 1912, ran through a small field of Smith Sound ice and small lumpy ice in lat. 73° N. when half way across Baffin Bay, between Long. 60°. 35′ W. and when returning from Pond's Inlet from August 25th, to Sept. 1st, the "Minnie Maud" sailing from Button Point to Disko, saw no indication whatever of the "middle-pack" or flo-ice but passed several dozen large icebergs, from Melville Bay, widely scattered.

Upernivik.—The Danish settlement of Upernivik is on a small island on the S. W. corner of Melville Bay, and navigators generally make a curve with the bay to avoid the "middle pack" ice which moves according to the wind. When the wind is west or S. W. the ice jams; it is forced up on the glaciers and if a vessel is caught she becomes frozen in by the young ice. Whalers are sometimes beset for a month or more in the pack of Melville Bay in the months of June and July. There are some clusters of islands along the coast which help to break the large fields of ice and open up leads for vessels.

Navigation.—Experience teaches the ice navigator that the safety of his ship depends upon his preventing her from being beset. No leads should be entered unless a clear way out again is seen. The "Algerine" and "Proteus" were lost in this way. If the wind is on the land, care should be taken to find out how much water there is between the ice and the land. As a general thing, the most open navigation is along the land, but the usual coast dangers have to be contended with, and a change of wind may crush a ship between the ice and the shore.

Middle-Pack.—Baffin Bay, Davis Strait and the east coast of Baffin Land are haunted all the year round by the dreaded "middle-pack", consisting of a jumbled mass of old Arctic ice, which extends from Smith Sound to the Labrador coasts, a distance of 1,500 miles. The "middle-pack" is the product of the annual out-put of the innumerable glaciers, frozen sounds and bays that surround Baffin Bay and of the heavy floes and bergs of old Polar Ocean (paleocrystic) ice that annually pour out of Smith, Jones and Lancaster Sounds into Baffin Bay.

This immence area of floating ice gradually drifts southward down the centre of Baffin Bay, along the eastern coast of Baffin Land, through Davis Strait into Cumberland and Frobisher gulfs, and then down the coast of Labrador and Newfoundland. From the "middle-pack" come the heavy ice-packs upon which so many thousands of Harp Seals are found and slaughtered every year, in such great numbers, in the months of March and April, off the Newfoundland coast. The icebergs and floes gradually melt and disappear as they come in contact with the warm waters of the Gulf Stream, altho the largest icebergs often reach as far south as lat. 45° N. as the unfortunate ocean-liner "Titanic" proved to her cost. The position of the "middle-pack" is always a source of the keenest anxiety to the navigators of Baffin Bay and the northern waters, as it is always shifting about, being driven north or south east or west, by the furious gales that rage in those latitudes. He can never tell before and where his ship will meet the dreaded floes, and must trust to his previous ice experience and to observations of the state of the sea, and the appearance of the horizon to hazard a conjecture as to the whereabouts of the icepack. A calm sea generally shows the icepack to be near, as the ice breaks the force of the winds on the water; while the rough sea generally means that there is no pack to windward. The pack also throws a whitish glare into the sky, known as the "ice-blink", which can be seen for a long distance.

The "middle-pack" seldom lies close to the coast of Greenland, as owing to the strong current that sweeps northward along the shore, the floe and sound ice is swept within the months of June and July to Melville Bay—whence it is swept westward towards Ponds Inlet and southwest along the Baffin coast by the strong current flowing out from Smith, Jones and Lancaster Sounds.

The Greenland coast is several degrees warmer than the Baffin shore, and while the Baffin coast is generally packed with ice until the month of September, the Greenland coast is generally clear of ice-floes, although not of icebergs, with open navigable waters as far as Melville Bay by the end of June. By the beginning of August, Melville Bay has been swept clear of ice-floes and there is generally open waters to Cape York and across to Lancaster Sound and Ponds Inlet. Early in August, ships generally have to cross Melville Bay and steer to within a degree of Cape York say lat. 75° N. in order to avoid the tail-end of the "middle-pack", before bearing away for Lancaster Sound and Ponds Inlet. The "Minnie Maud" saw no signs of the "middle-pack" in lat. 73° N. on August 24th and 25th, 1912; as the pack had had time to drift south to probably 72° N. consequently the northern part of Baffin Bay was clear, save for some floating pans from Smith Sound. Unless returned by southern gales the "middle-pack" drifts south about ten miles a day. Smith Sound remains frozen until the middle of August before sending its vast contingent of heavy ice southward, in consequence there is a wide interval of open water during the month of August between the two streams of ice from the north, and ships bound for Lancaster Strait and Ponds Inlet or Etah should best pass up the Greenland coast and across Melville Bay and North Baffin Bay in lat. 74° or 75° early in August, arriving in Ponds Inlet about August 12th.

Smith Sound Ice.—The Smith Sound ice continues to pour out into Baffin Bay in heavy floes, often square miles in extent, from the middle of August until the end of the year, and this stream finally joins the earlier ice from Lancaster Strait, Melville Bay and the Baffin Land Sounds in the western and southwestern part of Baffin Bay. All these ice streams from the great mass of the "middle-pack". On August 10th, 1904, the "Neptune" encountered a few miles south of Cape Sabine in Smith Sound, lat. 78– 40′ N., large masses of Arctic ice, which had just commenced to break loose from the fast ice and which was quickly emptying through Smith channel into Baffin Bay. All this ice was solid and from 20 to 40 feet thick having been formed in the Arctic Ocean for several years. This ice had recently broken away in great sheets (one of which was about six miles long and took the "Neptune" three quarters of an hour to steam past it) from the mouths of the bays whose inner surfaces were still frozen over.

The diverse characters of these large sheets of ice is further increased by the number of small icebergs often seen frozen into the mass with the Polar Sea ice. Under ordinary circumstances, this Smith Sound ice would arrive of Lancaster Strait and Pond's Inlet about the end of September, which is the time for a vessel to leave these places unless she intends to pass the winter in the ice.

The "Polaris".—A curious accident happened to the United States Government Ship "Polaris", in 1871, when returning by way of Smith Sound from an attempt, under Captain Hall, who died on the voyage, to reach the North Pole through Kane Bassan and Kennedy Channel. On her way south the ship was caught in the ice, on August 14th, in Kennedy Channel and remained fast in the pack until the 15th of October, when a furious gale broke up the pack in sight of Northumberland Island, nearly destroying the ship which had drifted with the ice over 200 miles in two months time. When this occured several of the party, who were landing stores on the ice, were left on the floes and they drifted southward 1,500 miles on the ice floe exposed to all the rigors and gales of the Arctic winter, until they were rescued six and a half months later, April 30th, 1872, by the "Tigress", off the coast of Labrador. This experience is unique in the annals of Arctic peril and hardship and we often pondered over the desperate expedients to which these unfortunate but hardy men must have been resorted in order to survive and endure the terrible cold and misery during their unvoluntary long voyage on the ice-pack. The "Polaris" was beached at Life Boat Cove near Etah and the remainder of the crew passed the winter in safety in a house built from the wreck. During the winter, two boats were built in which the party started to retreat on Upernivik, but were fortunately rescued by a relief steamer in the vicinity of Cape York.

East Cost of Baffin Land.—Ships entering or leaving Baffin Bay, should avoid the Baffin Land Coast, as the drift of the current of the North carries the ice-pack against the shore and the ice-floes extend out into the bay for a distance of over 100 and often 200 miles, while, save for icebergs, the Greenland is clear. In July 1912, the "Neptune" steamed north along the Baffin coast from Cumberland Gulf to Pond's Inlet and was battling with the ice-floes for over 700 miles. In 1904, the "Neptune," when steaming south along the Baffin coast from Pond's Inlet to Cumberland Gulf spent six days, from August 21st to 27th, battling against heavy ice-floes, fog and south-easterly gales and was forced by the heavy floes of northern ice to within a 100 miles of the island of Disko. The "Arctic," in 1907, when steaming south from Jones Sound to Cumberland Gulf, encountered S. E. and S. W. gales accompanied by rain and thick fogs from August 16th to August 24th, meeting the ice-pack in latitude 71° N. and long. 59°.30′ W. (within a hundred miles of Disko) which forced her to steer to the eastward and to follow the edge of the ice-pack. On August 24th, the ice was so thick, the "Arctic" was obliged to stop and to wait for openings in the ice, reaching Cumberland Gulf, which was full of ice, on August 25th.

The "Arctic" Cruise.—In September the ice-pack generally recedes from the Baffin Shores for a distance of 12 to 20 miles, leaving a lane of open waters upon which ships can sail, but if easterly winds occur, there is always danger of a ship being caught in the ice-floes and sunk or driven on shore. In September, 1909, the "Arctic" from September 3rd to 9th, steamed down the east coast of Baffin Land from Pond's Inlet to Cumberland Gulf, meeting no ice-floes until Cape Mercy was reached at the entrance of Cumberland Gulf. The "Arctic" left Albert Harbour on September 3rd, 1909, and visited Erik Harbour, which was not then on the chart. The harbour is about 3 miles wide at its mouth and 7 miles deep. Glaciers discharge into Erik Harbour, which with the wide entrance exposed to the north winds, make it unsafe to winter in or anchor there in summer. They then steamed to Cape Weld, noticing 5 glaciers together, before reaching the cape. The coast of Baffin Land was dangerous on account of icebergs which formed a line aground hiding the land from view, so that it was seen only occasionally. They had 240 fathoms of water in lat. 71°.30′ W. The emminent danger kept the officers constantly on the watch, as the weather was thick. Scott's Inlet was sighted on September 5th, 14 miles off. The coast for 5 to 6 miles east of Scott's Inlet is low, but Agnes Monument Island is a high peak covered with snow and at 7 p.m. the ship passed inside the island and entered a large bay in Clyde river which ran west north-west, and anchored at the far end of the bay alongside the whaling schooner "Jennie", commanded by Captain Samuel Bartlett, and chartered by Mr. Harry Whitney, of New-York, who had just returned from hunting musk oxen and bears in Ellesmere Land. On September the 7th, the "Arctic" proceded south along the land, passing Butte Island, where icebergs were aground everywhere along the coast, and gave assurance that there was no danger of going aground so long as the ship was kept outside of them. The weather was foggy with a north wind blowing. At noon they were in lat. 68° 37′ N., long. 64°.23′ W. Cape Searle was made at 4 a.m. September the 8th, and at six a.m. Searle Harbour was entered where the yacht "St. Hilda" of Southampton, England, in command of Captain Cooney, was at anchor. They left Searle Harbour at 11.30 a.m. and headed south. The weather was calm with a heavy swell, followed by light north wind. Many icebergs were passed in snow squalls, which compelled constant attention on the part of the navigation officers and sail was taken in. They were now crossing the Arctic Circle. At 3 a.m., September 9th, the weather cleared and they passed Cape Walsingham, full sail set before a north wind. Cape Walsingham is a bold cape, with an island at the end which was not on the chart. There is a rock, five miles off the headland, not on the chart and very dangerous for vessels. They steered for Cape Mercy and began to meet Cumberland Gulf ice and old floes. At 10.40 a.m. they passed the remarkable island called "Wareham" peculiar in height and shape. Ice was met and they had much difficulty in contending with it. They entered off Kekerton Station in Cumberland Gulf at 6.30 a.m. on September 10th. The "Arctic" reached Port Burwell at the southern entrance to Hudson Strait at 8 a.m. on September 15th.

Button Islands.—After passing by the Button Islands, where the tides are very strong, and which vessels, especially if they are weak-powered and slow, should avoid as they are not correctly chartered. There are 22 islands in the group.

East Coast of Baffin Land.—Although generally inaccessible on account of the ice-floes, the east coast of Baffin Land contains many good harbours and anchorages known only by the whaling captains who frequented those waters for many years. The coast has never been accurately surveyed, and Captain W. F. Milne, of the Scottish steam whalers "Eclipse" and "Esquimaux", gives the following interesting description of the best harbour to be found there: "The southern coast of Ponds' Inlet is more or less broken land with high peaks until you reach Eric Harbour. Cape Bowen should be surveyed for latitude and longitude as it should be further north and not so far east. Then to the south of Cape Bowen there are two islands with a fiord running S. W. by S. The next place of importance is Cout's Inlet where there are a few more fiords running W. after you pass Antobus. There is better anchorage in Dexterity fiord, 18 miles from Cape Adair, than to the S. of Cape Adair, which abound with deer. To the S. of Cape Adair you enter Scott's Inlet where there is a fine harbour. From Austin to Agnes Monument S. W. Clyde Harbour, there is a pretty good harbour inside of Bute Island called Refuge Harbour, there is a fiord S. of Scott's Inlet with 2 branches. Then south to that there is a bay to the N. of Cape Eglington where there is a fine harbour on the south shore. Natives are to be found and lots of salmon. From Bute Island to Austin in (Cape Aston) it is a low sandy coast. Austin is dangerous. Low land as far as Cape Raper. There is Isabella Bay and Antiliviag Harbour, which is a good harbour, keep the coast and from Cape Raper to harbour W. a quarter N., by compass, and anchor inside the hook. From there keep going S. 10 miles to Cape Kater, then go N. W. into a large bight to the N. of a small island. Home Bay is rather dangerous and full of islands and reefs. Don't attempt to go into the bay until you pass the 68th parallel Kangeakdjung. Then steer, keeping the land aboard and anchor half way between the mainland and the island. The harbor is called Hooper, but not the Hooper on the chart, and from there steer to Cape Broughton, there is a fine anchorage to the S. of that island and you can go on as far as you like, which is called Broughton Harbor in lat. 67°. 27′ N. From there steer for Merchants' Bay, inside of Cape Searle Island, on the W. point going to the entrance. Here is a bar with two feet and should not be attempted by the E. side. In Dunbar Harbour (Durham) there is a deposit of coal which might be looked into, it is considered the best harbour on the coast in lat. 67°.5′ N. From Dunbar Harbour to Cape Dier there is a bight 10 miles N. of Cape Dier where you can anchor in a S. W. wind. From Cape Dier steer W. by S. passing two islands, then to the W. N. W. where there is a fine basin to the S. W part of the bay called Exeter Bay.

"After having passed Cape Mercy entering into Cumberland Sound you can go into Nijadluk Harbour, recommended for large vessels. After passing that 11 miles about N. W. there is a good harbour in Abraham Bay. There is fine salmon in both harbours. From there proceeding N. N. E. there is a fine harbour 15 miles from Abraham Bay. From Abraham Bay to Kekerton, is about 40 miles, keep to the W. of Kekerton about one mile and anchor a mile abreast of the station. From Kekerton to Brown's Harbour is about 12 miles, the harbour lays on the N. side between islands and the mainland. There is a fine harbour at Mantillik Harbour, to the S. W. of Black Lead we anchor to the W. near the station, near a small island. There is also a fine harbour inside of two little island "Karodliun".

Wireless Observations.—As the climate of eastern Canada and the entire north Atlantic shipping trade is affected by the position and annual quantity of the ice-floes in Baffin Bay, and by the prevailing winds and temperatures, which are constantly varying in the northern lattitudes it would be of undoubtedly great value to the farmers of eastern Canada and to the shipping trade of both continents, if the Canadian Government were to establish a chain of meteorological observatories, each equiped with a wireless outfit at say: Resolution Island, Coburg Island (Cumberland Gulf), Cape Dier, Cape Kater, Cape Aston and Cape Adair on the Baffin Land coast; Button Point on Bylot Island; Cape Crawford on Brodeur Peninsula; Erebus Bay on North Devon; Cobourg Island in Jones Sound, and at Cape Sabine at Smith Sound. A station at Cape York and at Disko Islands or Upernivik would complete the chain and would keep the world daily informed on the conditions and changes of wind and temperatures and of the conditions and positions of the ice in the various localities. The cost of annual maintenance should not exceed $100,000.00 annually, and the information obtained about the movements of the ice in the most dangerous ice-zone in the world would be of incalculable benefit to shipping and commerce. Predictions could be made with considerable accuracy as to the probabilities of early or late spring or of mild or severe winters in the north-eastern states of Canada and the United States.

It appears that McMillan's Exp oring Expedition that is now in search of the New Arctic Land, that was discovered and named by Dr. Cook as Crocker's Land, has already established a wireless outfit at its base in Smith Sound. Undoubtedly with the rapid strides that are being made in aviation and with the perfection of the mechanical stability and increase in range of flying machines, aeroplanes or aero-hydroplanes will soon play a prominent part in the development and accessibility of the Arctic Regions.

Reach Pond's Inlet.—After leaving Disko Island, we sailed thro many large icebergs as far as N. lat. 73°.50′ N., then turning W. steered for Pond's Inlet, and arrived off Erik Harbour about 1 a.m. August 27th, being somewhat, ahead of our calculations, as we did not expect to see the land before another 12 or 15 hours. At 6 p. m., the night before, we ran through a quantity of heavy lumpy ice and passed a huge flat-topped iceberg which we did not see in the fog, until we had nearly run on top of it. Baffin Bay was covered with thousands of small divers swimming in the sea and feeding of small blue-fish. The occurrence of such a continuance of dead calms and light-breezes as we had encountered during the past 8 or 9 days was, we were informed, quite unusual at this time of the year.

The high hills which flanked Ponds' Inlet in our port side were covered with snow, and we tacked about all the morning against the light breeze through the ice-floes and came abreast of Button Point at 3 o'clock in the afternoon. The day was fine sunny and brisk with a cool breeze from the N. E. About one o'clock we saw the smoke of a steamer coming round the Bylot shore from the N. It proved to be the 'Neptune" returning from am ineffectual attempt to enter Arctic Bay in Admiralty Sound. She made straight for Albert Harbour, nozing her way through the heavy ice-floes that blocked the narrows. The breeze improved for an hour or two in the afternoon, and the schooner bowled along merrily at a 7 knot clip through the floes and ice-pans, giving herself some hasty bumps against the ice, one of which smashed two of the rotton planks in her port side; fortunately above the water-line or the story would have ended then and there The breeze dropping again we spent the night tacking about through the ice within 5 or 6 miles of Albert Harbour. We tried to tow the schooner with one of the gasoline boats but the engine balked and the attempt had to be abandoned. Three natives with two women and some dogs came alongside in a whale boat and we realized that we had at last arrived in the land of the Eskimo. These Eskimos gave us the first intelligence of the loss of the "Algerine" on July 16th, near Erik Harbour.

Meet the Neptune.—The next day, August 28th, was clear, cold and frosty. The entrance to the narrows was jammed solidly with ice-pans, behind us the flows having been blown in from the sea by the easterly wind. Fresh ice was forming all around us and the pans cut us off from Albert Harbour where the "Neptune" lay at anchor behind Belœil Island. In the morning a steam launch struggled out of the harbour and by dint of poling managed to come alongside. On board were some members of the Scott Expedition who told us that there were no sign of gold at Salmon River or in this region; that counting the "Algerine" survivors they were 52 men aboard the "Neptune" and that they were to make another

The first Eskimos we met July 1910

The Pond's Inlet Eskimos at Button Point attempt tomorrow to enter "Arctic Bay", with the idea of building a shack there and leaving 4 men during the winter, when the rest of the expedition would return home. They told us that the "Neptune" a week or so before, had caught in the ice-pans and was nearly driven on shore in a gale near Salmon River and that they were all glad to leave this desolate region. It was not encouraging news for our party and al ideas of amassing a fortune quickly from rich deposits of placer gold were rudely dispelled. They said that the prospectors of both expeditions were disgusted of having lost a whole season's prospecting in more promising regions and were vowing vengeance on the author of what they termed very freely a "fake" and a "hoax"

Nearly Ashore.—We spent the day poling and wharping the schooner by means of ice-anchors through the ice-pans and it was tedious and laborious work. We were tired out with want of sleep and continuous exertion, and the discourageous news brought to us by the "Neptune's" steam launch did not tend to raise out spirits. About teatime the pressure of the ice-floes carried us periliously near the stiff rocks on the shore, the ship being driven by the ice-pans under pressure of the out floating current within 50 feet of the black and forbidding rocks. At one time, it looked as if nothing could save her from being pressed ashore but by hard poling and warping on the ice-anchors and with half the men out on the ice-pans which surrounded the vessel, we managed to warpe her out of the dangerous position and anchor to an ice-pan near the eastern entrance of Albert Harbour, where we remained all night. Next morning August 29th, we found that ship and ice-pan had been drifted bodily several miles back towards Button Point and we began to despair of ever reaching the bleak hole in the hills that was our goal. At midway the "Neptune" steamed out of the harbour and, pushing her way through the loose floes, approached to within a few hundred yards of the schooner when she dropped a boat and Mr. Scott with two companions, came on board. Mr. Scott told us that they were going musk-ox hunting after making another attempt to enter Arctic Bay and then they would steam for home. Mr. Scott offered to tow us into the harbor but for some reason the offer was not accepted. So saying good-bye they returned to the "Neptune" which, after an exchange of flag salutes, steamed away. They were the last whitemen we were to see until we reached Quebec, fourteen months later and a good deal of our enthusiasm went with them as we viewed our bleak and inhospitable surroundings.

Reach Albert Harbour.—We managed to struggle into Albert Harbour at 8 o'clock that evening, and anchored abreast the Government Depot, in 14 fathoms of water. A watch was kept on deck all night to pole away the ice-pans that kept floating on the ship, and next morning we moved the schooner over a little cove under the lee of Belœil Island, whose bare, rocky, boulder-strewn walls towered nearly a 1,000 feet above us.

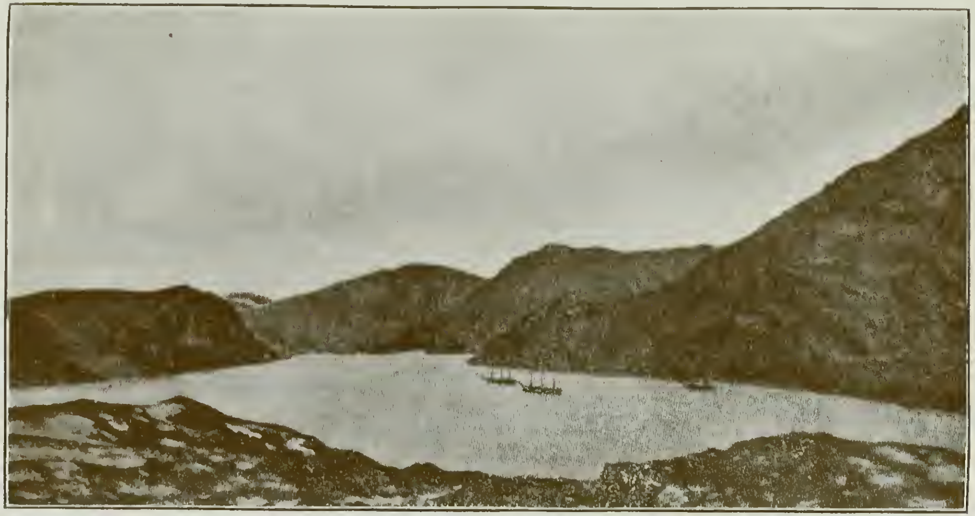
Although affording a splendid anchorage in 15 to 20 fathoms of water, sheltered against all winds, a more desolate, bleak and forbidding spot than Albert Harbour can scarcely be imagined.

It is surrounded, on all sides, by black barren hills or crumbling gneiss which tower 1,000 to 1,500 feet above its gloomy waters. Cold winds whistle through it constantly, the sun seldom shines there, and the patches of snow on the bleak hills and the treacherous ice-floes that are constantly drifting through its narrow entrance, heighten the soul-chilling impression of gloom and desolation. The exact location of Albert Harbour according to observations taken by the "Arctic" in 1906 is lat. 72°.42′ 32″ N., Long. 77°.50′ W. and the magnetic variation of the compass is 90° to 93° W.

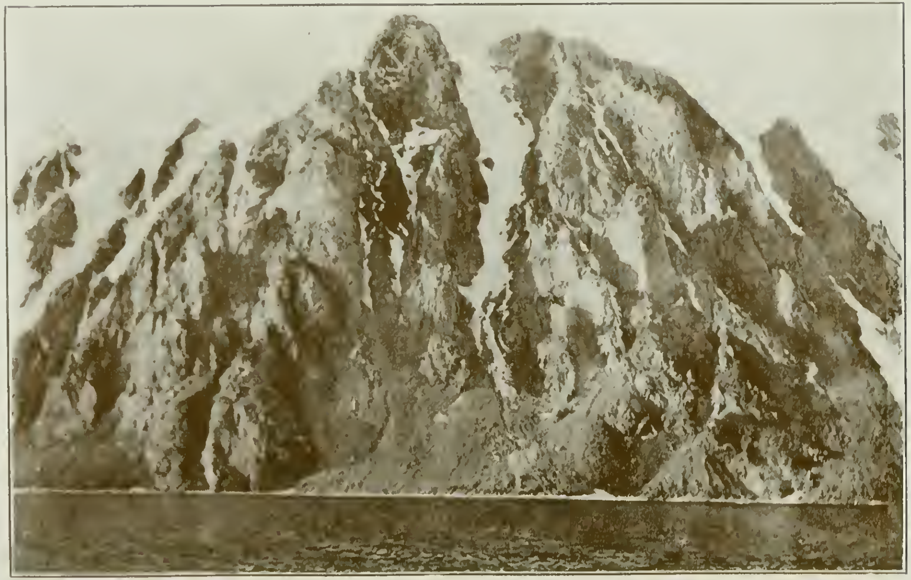
The harbour is situated about 20 miles from Button Point, on the Baffin Land coast, and is a mile long and 3,000 feet wide, lying between Belœil Island and the mainland. The eastern entrance is 3,842 feet wide and the western entrance is 482 feet across with 14 fathoms of water in the mid channel. The tide rises nine feet in Albert Harbour, according to season of the moon, and the flow is irregular depending upon the direction of the wind.

The narrows, between Belœil Island and the opposite shore of Bylot Island, are 35,324 feet or nearly seven miles wide. Belœil Island which encloses the harbour on the north side is a high rocky mass of gneiss, 8,200 feet long and 950 feet high, which harbours a few hares and provides splendid shelter and anchorage for ships against the winds that blow. Albert Harbour is the only safe harbour winter and summer, in the Ponds' Inlet region. There is no anchorage near the northeast entrance and although there is a gravel bank and beach and river delta on the eastern shore, by keeping in mid-channel there is plenty of deep water and clear passage into the harbour which lies behind the angle of Belœil Island. In Ponds' Inlet there are 460 fathoms of water. The only drawback to Albert Harbour is the short season it is opened and accessible for ordinary ships, August 8th to October 1st.

Button Point.—Button Point affords good anchorage in 12 fathoms of water, in front of a small circular bay, about 600 yards deep and wide, into which runs a small creek, but there is no protection from the winds and ice-floes when the wind blows from the southeast to southwest; and a ship has to have steam up and be always ready to hoist anchor and away at a minute's notice. The winds in July and August are very variable and liable to veer from one point to another with surprising quickness, with the result that the Ponds' Inlet narrows may be ice-free at one part of the day and in a few hours a sudden change of wind will completely jam the passage with ice-floes, which will in a few days, be blown away again.



Port Albert



Peak King George, Pond Inlet, August 1st, 1910.

Erik Harbour.—Erik Harbour is about 37 miles, east by south of Albert Harbour and is about 20 miles southeast of Button Point. The measurements of Erik Harbour, which were taken by the members of the Arctic Expedition in 1906, are 38,500 feet deep and 13,600 feet wide at the entrance. There are two good anchorage grounds in about 9 or 10 fathoms of water, at the far end of the bay, on the southwest side, opposite a large glacier. Erik Harbour is not safe as a winter or summer harbour as its wide mouth leaves it exposed to northeast winds, and a heavy gale from that quarter fills the harbour with heavy Arctic ice-pans which are liable to drive a vessel ashore. There are no Eskimos at Erik Harbour. In fact the whole eastern coast of Baffin Land from Cumberland Gulf to Ponds' Inlet, with the exception of Home Bay and Cape Kater, is devoid of Eskimos. At Clyde River, a few families from Ponds' Inlet, pass the summer hunting caribou and fishing salmon. Home Bay is full of seal and at Cape Kater, Polar bears are killed.

CHAPTER II

TRADING, TRAPPING AND PROSPECTING WITH THE ESKIMOS

Mooring Schooner.—The first few days at Albert Harbour, were spent in mooring the schooner for the winter in a small cove near the western entrance of the harbour, close to the frowning walls of Beloeil Island. Two anchors were dropped in fifteen fathoms of water, the bow pointing east, and two rope hawsers were run from each side of the bow to the boulders on shore with two steel wire hawsers from the stern to the shore, about 100 feet away. The stern of the ship was brought in line with a small rocky point and the Government cache near this point were some bad rocks under water close to the shore which should be avoided by vessels. We hauled cargo from the hold and loaded it into boats for transfer to the village.

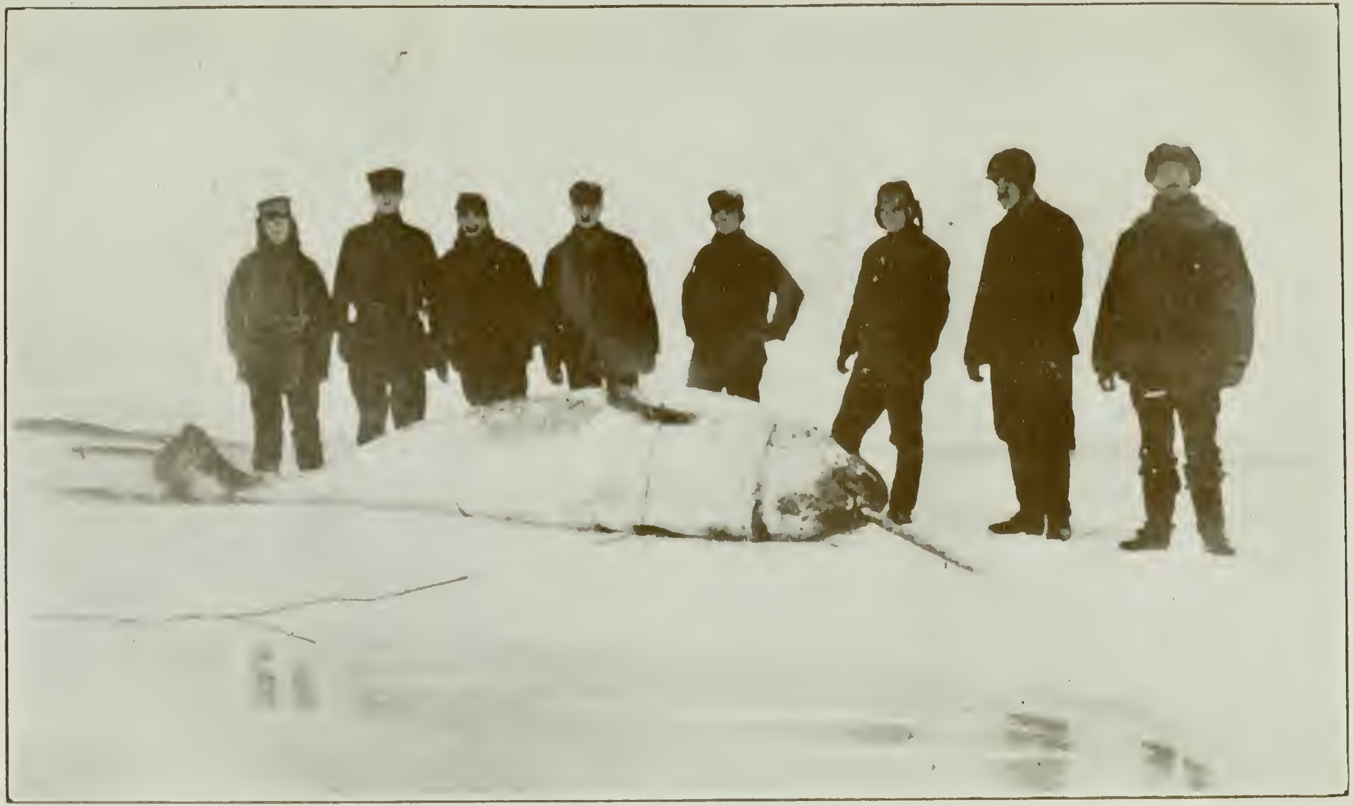
The Narwhal.—Narwhal kept plunging through the narrow harbour, hugging the south shore and going west up Eclipse Sound, always keeping close to the shore and passing within a few hundred feet from the steep rocks near the village, where the natives shoot them from the rock. A couple of Eskimos wait by the shore in their kayaks and whenever a narwhal is shot from the rocks, they dart out and, harpooning the carcase, drag it ashore. If they are not quick in sinking a harpoon into the wounded animal, the weight of the horn and the head will cause it sink slowly and be lost. We shot several in the eastern narrows of the harbour, but they dived and escaped. The narwhal whose scientific name is *Monodon Monoceras*, travels in bands and appears to prefer the proximity of ice, probabely to escape the attacks of the giant Killer which pursues it relentlessly. The Baffin Bay whalers obtain a considerable quantity of narwhal ivory from the natives of North Greenland, the best place being in the vicinity of Cape York and Melville Bay. They are also found in Cumberland Gulf, on the shores of Hudson Strait, in Fox Channel and Frozen Strait. They are very plintiful in Ponds Inlet, Albert Harbour, Button Point, Eclipse Sound, Arctic Sound Milne Inlet, Kuluktoo, Toolooria and at Kiluteas (Navy board Inlet); at Baillarger Bay, Elwin Inlet, Strathcona Sound, Adams Sound, and Moffet Bay (Admiralty Sound); Peel Sound, Erebus Bay and especially at Port Leopold, North Somerset.

As many as 300 have been killed in a single season by the natives of Ponds Inlet who used the ivory horn to make carved ornements of sleds, kayaks dogs, animals and harpoon barbs. They also eat the flesh, which is coarse and dark; and the boiled skin (mûktûk) is a native dainty, being soft and gelatinous.

Narwhal Horn.—The narwhal attains a length of between 20 and 30 feet and a weight of two tons. It is distinguished from the white whale (or white porpoise) by its darker colour, its white spots and its horn. The colour of the narwhal becomes lighter with age, so that very old individuals become dirty white. According to the Eskimos, the horn is confined to the males, and its chief use is for domestic bottles. Only one horn is usually developed which grows out of the upper jaw, projecting directly forward. A second horn on the other side of the jaw is not uncommon, but it is always shorter, and is often malformed or rudimentary. The horn varies in length up to eight feet, and is composed of very fine ivory. At the base the average thickness is from two to three inches; it tapers to a point and has a spiral twist throughout the length. There is a large pith core at the base, which gradually fills after the horn has reached maturity, so that in the older animals the horn is almost completely solid. The ivory is worth from $1.50 to $3.00 a pound. The ultimate destination of the ivory is China, where it is used for ornemental purposes as well as for medecine, and for the manufacture of cups, as it is supposed to absorb all poisons placed in them.

Habits.—The narwhals are very sportive in their habits and we often used to watch them from the cliffs playing about and diving in and out amongst the holes in the ice floes of Eclipse Sound. They enter the sounds in the spring and return to ocean in the fall. These fish are easily approached and take but little notice if a vessel, although the sound of the propeller striking the water will frighten them, from a long way off, as they have a keen sense of hearing and the water is an excellent sound conductor. The narwhals are not so dangerous when hunted as are the vicious walrus. They need to be shot in the head to kill them instantly or otherwise they will dive and escape. A solid metal-jacketted bone-piercing bullet is the best for killing narwhal. The natives shoot and harpoon them in the cracks of the ice-floes in June, July and August and then haul them on to the ice-pans, where they cut off the blubber, skin and horn. If they kill them in open water in August and September they tow the carcase by the horn to the shore, where they cut up and cache the meat under cairns of heavy stones for winter consumption.

The Killer.—The Killer, otherwise known as the Grampus or Swordfish, is very voracious and savage. It lives largely upon fish, seals, porpoises and white whales. It also attacks large Right



Narwhale killed in Admiralty Inlet.

1—Arctic White Fox.
2—The Arctic Wolf.

whales, and on this account is disliked by the whalers, as the presence of a single killer, means the immediate flight of all creatures in the vicinity. Luckily it will not penetrate among the heavy floes, where the Right Whales and narwhal retreat for safety. Some idea, says Low, of the destruction to life caused by the killer may be formed by the fact that in the stomach of one were found the bodies of fourteen porpoises and large seals; it chocked to death swallowing the fifteenth. They chase the seals and white whales on shore, and the seals are often seen jumping clear out of water in their endeavour to escape.

The Eskimos are very much afraid of the killers, which they call Ardloo. Pewiktoo told us that they generally hunt in families consisting of the male, female and progeny. He said that when they attack a large whale the two adult killers attack it from opposite sides, ramming the whale at full speed on either flank. We saw one day in August, a familly of ten killers, consisting of two large ones and eight small ones, pursuing a school of narwhal up Ecilpse Sound; the narwhals were plunging and blowing ahead at a great rate in their desperate efforts to escape.

Killer vs Bowhead.—Bullen in his "Cruise of the Cachalot" gives the following description of a fight that he once witnessed in the Okhotsk Sea between three "killers" and a large Bowhead whale: "While all the boats were away a large bowhead rose near the ship, evidently being harrassed in some way by enemies, which I could not at first see. He seemed quite unconscious of his proximity to the ship, though, and at last came so near that the whole performance was as visible as if it had been got up for my benefit. Three "killers', were attacking him at once, like wolves worrying a bull, except that his motions were far less lively than those of any bull would have been. The first inkling I got of what was really going on was the leaping of a killer high into the air by the side of the whale, and descending upon the victim's broad, smooth back with a resounding crash. I saw that the killer was provided with a pair of huge fins-one on his back, the other on his belly—which at first sight looked as if they were also weapons of offence. A little observation convinced me that they were fins only. Again and again the agressor leaped into the air, falling each time on the whale's back as if to beat him into submission.

"The sea around foamed and boiled like a couldron, so that it was only occasional glimpses I was able to catch of the two killers, until presently the worried whale lifted his head clear out of the surrounding smother, revealing the two furies hanging—one on either side—to his lips, as if endeavouring to drag his mouth open-which I afterwards saw was their principal object, as whenever during the tumult I caught sight of them they were still in the same position. At last the tremendous and incessant blows, dealt by the most active member of the trio, seemed actually to have exhausted the immense vitality of the great bowhead, for he lay supine upon the surface. Then the three joined their forces and succeeded in dragging open his cavernous mouth, into which they freeley entered devouring his tongue. This, then, had been their sole object, for as soon as they had finished their barbarous feast they departed, leaving him helpless and dying to fall an easy prey to our returning boats."

"The "Killer" or Orca Gladiator" writes Bullen," is a true whale, but like the cachalot, has teeth. He differs from that great cetacean, though in a most important particular; *i. e.* by having a complete set in both upper and lower jaws, like any other carnivore. By some authorities he is thought to be identical with the grampus, but whalers all consider the animals quite distinct.

The Eskimos, The need of Tobacco.—The Eskimos during those days would come aboard the schooner in their boats and kayaks, bringing skin and ivory to exchange for tobaccoand cartridges. No vessel had entered Ponds Inlet in the preceding year and, in consequence, they had passed a very hard winter, having neither tobacco nor cartridges, and they suffered consequently in health and spirits. Tobacco is almost a necessity for the Eskimos, who smoke and chew incessantly. The women and children also use it. It is their one great craving and without the consolation of "My Lady Nicotine", life in the Arctic, to must of us would be very comfortless and dreary.

The Scotch Whalers.—The natives seemed very disappointed in the size of the schooner, as the visits of the "Neptune", "Arctic" and the steam-whalers had accustomed them to bigger ships. They marvelled how such a small ship could have managed to make such a long voyage and said she could not have brought enough provisions to feed them all during the winter. When the Scotch whalers visited Ponds Inlet regularly, they used to give the Eskimos a scant weekly allowance of biscuits, tea, molasses, and tobacco during the dark winter months, in order to keep them on hand until spring arrived, when the men were sent out on the ice-pans, armed with guns and harpoon, to hunt narwhal and seal in the ice-cracks near the open water at Button Point, while the women were employed in boiling down the blubber into oil,which was shipped away in the Fall. The whaling ships used to hunt whale along the coast of Greenland, in the months of June and July, arriving off Cape York and Whale Sound at the middle of July. They would enter Ponds Inlet at the end of July or beginning of August; navigate Lancaster Sound as far as Erebus Bay, Port Leopold and Batty Bay during August and would then coast down the East Coast of Baffin Land in the month of September. There was also a whaling station at Clyde River and at Cape Kater, as well as at Cumberland Sound and Frobisher Bay.

Ponds Inlet Village.—On Sunday September 1st, we paid a visit, in the gazoline launch, to the native village and former Scotch whaling station at Ponds Inlet cove, about 3½ miles west of Albert Harbour. The hills of bare rock, 1400 feet high, descend into the sea in sheer impassable cliffs between the village and the harbour and the only land passage between the two places is through a rocky valley, which leads from Cameo Bay in the eastern harbour, back of Morin Mountain. At the foot of the latter is the Government depot of provisions and Brokenhauser's grave. Brokenhauser was an oiler on board the "Arctic" who died in Albert Harbour on February 11th 1907.

On arrival at the village, we found some nineteen sealskin tents or toopiks, inhabited by about fifty Eskimos, man, women and children who raised shouts of "Saimo" (welcome) as we rounded the rocky point. Dogs were growling and fighting every-where over the greasy and gory remains of a narwhal that had recently been killed and hauled up on the shore-ice. The children wandered about with a piece of raw blubber in their hands, which, in the process of eating, became smeared all over their very dirty little faces. The tents and surrounding ground were unspeakably dirty and redolent of raw and putrefying blubber and other filth. In the centre of the village, on a small plateau at the base of the high massive mountain of "Ee-yook-tsua" stood a house of wood and galvanised iron, which had been built and used by the Dundee Whaling Firm as a trading station. Their agents were Messrs Mutch and Cameron, who took it in turns to spend a year alternately at Ponds Inlet, living alone with the Eskimos.

The house contained six rooms, which we used as a trading headquarters. Part of the expedition lived there at Christmas and New-Year and later again in the summer. The long room in front, about 18 x 10 feet was used as kitchen, dining-room, living room, trading store, Eskimos reception room, concert and dance hall. Being fitted with a bench, iron screw-vize and anvil, this room was also used as a workshop, where the natives repaired their broken sleds, harpoons, and rifles. The men slept in wooden bunks in two small rooms off the long room. The rest of the house and attic were used for storing provisions, trading goods, skins and ivory.

In front of the house was a flag-staff and some huge empty tins which had been left by the whalers. This residence in 72° 40′ N is the most northerly habitation on the Americain Continent, and with the exception of the village of Etah, in Smith's Sound, the most northerly habitation in the world.

From the small rocky knoll, to the west of the village, a magnificent view is obtained of Eclipse Sound, to the West, and of the glaciers and splendid snow-capped peaks of Bylot Island, across the Sound to the north.

Salmon River.—The next day, leaving one man to guard the schooner, the whole party proceeded in boats to Salmon River about 15 miles west of Albert Harbour. We took with us heavy cargoes of lumber, stores, tools, and bedding; and reached Salmon River at 2 p. m. ; the gazoline launch being used to tow three other heavily laden boats. The mouth of the river is shallow and extend in a wide sand delta about a mile out into the sound. East of the mouth is a rocky point the site of the ancient Eskimo village and burial ground of Killalookan, where ships can anchor in deep water close to the shore

Here the S.S. Neptune anchored in 1904 alongside the Scotch whalers Eclipse and Diana. On August 21st a strong gale from the eastward sprang up, when the Diana broke adrift and lost an anchor and thirty fathoms of chain. The bay east of the point is full of huge submerged boulders near the shore. We camped at the Government shed that had been built on the east bank, and slept in blankets on the dirty floor boards. The salmon were by this time all up at the lake spawning. Geese and ducks were flying overhead and an occasional seal would pop its enquiring head above the waters of the Sound. Two weeks were passed at Salmon River, building a wooden shack on a sand pit on the west bank, prospecting the river-bed for gold, examining the coal-beds and exploring the lake region about eight miles inland. No traces of gold were found and, so far, none has been found north of Hudson Strait. Dr Rae found quartz coloured by oxide of iron, and containing particles of gold, on shore of Repulse Bay in Lat. 66° 30′ N, Long. 87° W. Rae and Caldwell also reported finding gold in the dark rocks at the head of Wager Inlet, where Dr Rae found specimens of free gold.

Gold.—The Eskimos of Igloolik reported to Mr Tremblay that there was metal resembling gold in some of the quartz veins the north of Melville Peninsula and on the north shore of Fox Channel. Gold is liable to be found in the quartz veins, quartzitas, and schists of the Huronians rocks, and in undisturbed-bed Tertiary sands and clays in the form of placer gold deposits, if the precious metal occurs in the underlying Laurentian and Huronian rocks. In the year 1612, James Hall and William Baffin, made a voyage to the west coast of Greenland, in search of a goldmine at Cunningham fiord, near the Arctic circle, where gold was said to have been worked by the Danes. No gold was found but traces of old working was discovered.

Up to the present date, however, no sign has been discovered of any gold deposits existing north of the Arctis circle.

Description of Salmon River District.—The sand in the bed of Salmon River is made up of fine grains of quartz, garnet, hornblende and magnetite. There was no trace of gold evident in the bed of the banks of the river, or in the adjacent country which

1—Ponds Inlet Village.
2—The "Minnie Maud" in winter quarter at Albert Harbour.

1—Salmon River.
2—Fishing salmon a net at Salmon River.

consists of a series of rounded hills and plateaus which rise from a few feet to one hunderd feet on the coast, and five or six hundred feet high, six or seven miles inland. These hills consist of yellow and red sandstone, covered in many places with a covering, a few feet thick, of whitish clay. The straight line of rocky mountains which rise, wall-like, about eight to four miles to the south of Salmon River and which run east and west are of crumbling gneiss and barren of any mineral. There is a very noticeable gap in these hills, almost due south of the north of Salmon River, about nine miles away in a bee-line, in which lies a beautiful clear lake of crystal water, which is well stocked with giant red trout. This deep narrow gap in the blue-black mountains is a very noticeable landmark and is useful to steer by when travelling with sledges on the frozen sound. Back of these mountains, to the south-west, lies Oliver Sound, the entrance to which is about 20 miles from Salmon River. The Salmon River plain extends from Janes Creek about 7½ miles west of Albert Harbour and half way to Salmon River to Oliver Sound in the form of a triangle to its base 10 miles deep at Jones Creek and its apox is a few miles north of the entrance to Oliver Sound, where the rocky hills run out to the coast.

The plains and hills are dotted with numerous lakes and ponds which are filled with small trout and cut by numerous ravines, gullies, and small streams. In summer time the plains and hills are covered with moss, turf, coarse grass, stunted herbage and heather. In the months of June, July and August innumerable bright coloured flowers, white, green, red, yellow, purple, mauve and blue, besprinkle and enliven the landscape. In June the birds arrive, and white geese eiders, black and several other species of duck, russet-brown cranes, golden plover, snowflakes, lapland longspur, arctic owl, and other species nest and breed in the marshes. The number of old caribou antlers scattered about everywhere, bear silent witness to the presence of numerous reindeer in the olden days, before the Eskimos killed them off. A few caribou are still to be found in the hills to the South. Salmon River itself is a considerable stream which is about 20 miles long and fed by numerous side-streams and has its origin near a large glacier about ten miles due south of Ponds Inlet village. The riverbed varies from eighty to two hundred yards and flows between hills seven hundred feet high. Its bed consists of an uninterrupted series of rapids and falls filled with boulders and gravel banks. We managed with great difficulty to pole and tow two punts up its tortuous and rocky bed as far as the three lakes from which it flows, about eight or ten miles inland. But it was hard work, and we were wading waist-deep in ice-cold water most of the time and kept slipping and stumbling over the sharp jagged boulders that lined its course.

The Salmon Lakes.—The first lake is about a mile long and is connected with the second or middle lake by means of a short rapid. Both the first and middle lakes are muddy. The middle lake is about three miles long with a large bay in the north-east corner, about two miles long into which the upper-river flowes through clay and sandstone hills from the glacier. The third lake lies in the Gap to the south of the middle lake, from which it is separated by a short shallow stream curves round a rocky knoll. The third lake, which is about 4 miles long and a quarter of a mile wide, is enclosed by high precipitous rocky walls which tower above it and shut out the sunlight from its ice-covered surface. This third lake is the home of the red trout whose gleaming red bodies can be seen darting about in its clear, crystal depths. The middle lake is the spawning ground and winter quarters of the salmon that, from September to June, frequent its waters in thousands. Some giant specimens of the red trout descend from their own lake into the middle, Salmon Lake and interbreed with the salmons as we caught with a seine over a hundred of these half-breed salmon that havered bellies covered with silver and yellow spots, denoting their semi-trout parentage. In a clear shallow creek, between these two lakes we saw a dozen of these giant trout and scores of beautiful salmon lazily swimming, preparatory to spawning on the nearby gravel bed. There is a flat gravel spit near this creek, clear of brush and boulers, that would form an ideal camping and fishing ground from which to cast a fly at these beautiful game fish. We fall lamented the fact we had brought no rods and flies or fishing tackle and often speculated on the sport we could havehad inhooking andplaying one of these 15lbs crimson trout or silver salmon. We caught in the net seven of these beautiful trout which weighted fully 12 to 15 pounds a-piece.

The Arctic Salmon.—The Salmon descend to the sea in the middle of June, when the lakes begin to unfreeze and the rivers to run. The spring salmon run from lake to sea from June 15th to July 5th; when they gorged themselves on shrimps, tonning cod and small fish resembling whiting that swarm at the river mouth and at the mouths of all the small creeks that flow into the sound. The salmon cruise leisurely along the shore of the sound at a rate of 2½ miles an hour during July and August when they become very fat. During the month of August, from the fifth to the 25th, they ascend the river to spawn. By the first of September they are all up in the lake. By the end of September the lakes and rivers are frozen until the following June. What the fish live on in the muddy and frozen waters of the lake, during their long incarceration is a mystery, unless they become half frozen into a somnolent state and only revive when the waters begin to run in the spring. The fish seem to descend and ascend the river in greatest numbers when the moon is full. The spring salmon were long and narrow, although when boiled they were remarkably good to eat but drier than in the Fall, when the fish are very fat chunky and deep at the shoulder, and the females full of ripe, yellow eggs, ready to spawn. The Salmon ran from 20 to 30 inches in length, and four and six inches in depth and thickness at the shoulder. The weight was from 3 to 20 pounds. The average weight of 3000 fish caught in the nets at the mouth of Salmon River and Janes Creek was about six pounds. As many as 250 fish were caught in a single draw of the seine.

Where Salmon are Found.— There are a dozen river flowing in Eclipse Sound which contain salmon, those from Arctic Sound, Koluktoo, and Janes Creek being especially large and of fine flavour. There are about seven salmon rivers flowing into Admiralty Sound; about 20 rivers containing salmon flowing into Fox Channel within a radious of 100 miles from Igloolik; two fine salmon rivers at Aggo. There are fine salmon rivers at Clyde River and in Cumberland Gulf on the east coast of Baffin Land, and the great lake of Natiiling and Amagjuak and the rivers on the west coast of Baffin Land are said to swarm with fine salmon. There are also salmon in the rivers of North-Somerset. The salmon in lake Taseonia in Melville Peninsula, are said by Eskimos to be as large as seal, fully 4 feet and over in length. The arctic salmon are apparently not found north of Lancaster Strait as the lakes freeze solid to the bottom. Dr Sutherland in 1850-1 found some small salmon in a lake in the south-east extremity Cornwallis island.

Ennemies of the Salmon.—The arctic salmon have many ennemies to contend with in the shape of sea-gulls, fish-hawks, divers and loons, which congregated in great numbers along the rivers when the salmon are running, as the fish often get stranded in shallow places or become disabled by the sharp boulders when passing up and down the rapids, when they are immediately pounced on and devoured by their bird foes. Mr Fox is also fond of salmon when he can get one. The seal also prey on and kill more salmon than they can swallow in the bays at the river mouths. The Eskimos from circular traps for the salmon in the shallow beds of the streams, made out of boulders which they call "Sarpootik". Here the fish become impounded and are speared in great numbers every fall by the natives, who cache them under stones for winter consomption. In the spring the natives harpoon the salmon from the ice round the mouths of the rivers.

Arctic Birds.—Among the birds at Salmon River, we noticed ptarmigan, snow-owls, snowflakes, arctic ravens, red-throated loons, fish-hawks, golden-plovers, snow-geese, king-eider duck, long-tailed jaeger, black duck, plover, sandpiper, pipit, snipe, russet-brown cranes, lapland longspur, and many others

Golden Plover.—The golden plover comes all the ways from the Argentine Republic by way of Venezuala, the Caribbean Sea, Bermuda and Labrador to nest and breed in the Arctic zone. Those beautiful little songbirds, the Lapland Longspur, immediately on their arrival begin to construct a nest of dried grasses generally placed on the side of a tussock and much exposed. The female bird gathers the material for the nest and then commences to lay and incubate the eggs, while her little male companion hovers on high, pouring forth his joyous trill in the balmy sunshine. These little birds have a bobolink fashion of soaring up in the air, and then descending in circles on outstretched wings, volplaning to earth and piping out a long trill of melodious throat notes, which is very inspiring after the death-like stillness of the frozen atmosphere during the long, dark silent winter months.

Arctic Tern.—At Button Point millions of arctic tern arrive in early June and darken the sky as with a dense pall of smoke. They leave in August when the sun begins to droop behind the Bylot peaks. Mr Wells W. Cooke of the U. S. Biological Survey, writing in the National Geographic Magazine, in April 1911, writes of the Arctic tern: The world's navigation champion is the Arctic Terns. It deserves its title of Arctic, for it nests as far north as land has been discovered; that is as far north as the bird can find anything stable on which to construct its nest. Indeed so Arctic are the conditions, under which it breeds that the first nest found by man in this region, only 7½ degree from the pole, contained a dowing chick surrounded by a wall of newly fallen snow that had been scooped out of the nest by the parent. When the young are full grown the entire family leaves the Arctic, and several months later they are found skirting the edge of the Antarctic Continent. What their track is over 11,000 miles of intervening space no one knows. The Arctic terns arrive in the far-north about June 15th and leave about August 25th, thus staying fourteen weeks at the nesting site. They probably spen a few weeks longer in the winter than in the summer time; and if so, this leaves them scarcely 20 weeks for the round trip of 22,000 miles: not less than 150 miles in a straight line must be their daily task and this is undoubtedly multiplied several times by their zig-zag twisting and turning in pursuit of food.

The Arctic terns have more hours of daylight and sunlight than any other animal on the globe. At their most northernly nesting site, the midnight sun has already appeared before their arrival and it never sets during their entire stay at their breading grounds in the Arctic Circle, where they repair in millions every year. During two months of their sojourn in the Antarctic they do not see a sunset (November 15th to January 15th) and for the rest of the time the sun dips only a little way below the horizon, and broad daylight continues all night. The birds have therefore, twenty-four hours of daylight for at least eight months in the year, and during the other four months have considerably more daylight than darkness.

The Arctic Tern arrive at Button Point, Bylot Island, in May and June. They come in dense clouds, flying so closely packed together that they blacken the sky and on calm days the noise of their wings makes a deafening noise. Their rate of flight approximates a mile a minute. They make straight for the high rock ledges in the cliffs, about 500 feet above the sea. Every morning about 2 a. m. they fly in a solid cloud away over the ice-flœs near the land to the open water, ten or fifteen miles away, in search of food. They return in the same dense formation every evening at 6. p. m. We saw one bunch of these Terns flying in a westerly direction along the south shore of Bylot Island, that extended in a solid black impenetrable cloud over a mile in lenght, some 20 feet thick and several hundred yards wide. They were flying at a rate of over 60 miles an hour and only about 50 feet above the surface of the ice-covered sound. It would be a nice little mathematical study, taking the dimensions of the average tern, to calculate how many there were in this single flock. The Eskimos are very fond of their eggs.

Antarctic Penguin.—While on the subject of Arctic birds, we might venture the suggestion that it would pay the Canadian Government to introduce the Giant Penguin of the Antarctic, where they are found in millions on the edges of the ice-fringe, in the waters of the Arctic Islands and Hudson Bay where they would thrive mightily upon the abundant marine life and would be of inestimable value to the Eskimo as an additional article of food, fuel and bedding. Their eggs and flesh providing the food; their oil, fuel; and the feathers, bedding. One of the Antarctic Expeditions could be commissioned to bring a consignment. The manner of feeding and keeping them alive when crossing the tropics would be the principle problem, but this no doubt could be solved by proper study and precaution.

Arctic Hares.—The Arctic hares frequent the deep ravines and rocky hillsides. Their weight, when dressed is at least eight pound and often exceeds that weight; their meat has an excellent flavour. The fur is beautifully white and sold although the tips of the ears are black and the hair is so long and loose that it flutters in the wind. They climb cliffs at a wonderful rate often ascending perpendicular cliffs and hillsides, several hundred feet high, with the greatest ease. The female brings forth her young ones, usually four in number, about the end of June.

Non-Migratory Birds.—The only birds that do not migrate from the Arctic in the winter time are the snowy-owls, the Ptarmigan and the Arctic Raven.

Snowy Owl.—The Snowy Owl is found in most of the Arctic Islands, where the lemming and ptarmigan are numerous, which is their principal prey. Their nests are placed on small dunes, or earth mounds and are merely a slight hollow in the soil, no material being employed in its construction. The young snowy owl is covered with down of a dirty colour which as the bird becomes older, gradually turns to a dark drab. When the nest of this bird was disturbed, the male showed fight, while his mate from her distant perch on a rock gave vent to plantif mews. The male would circle over-head, clattering his bill with astonishing rapidity and giving out hoarse cries of "woo". These birds are equipped with wonderful powers of vision which makes it difficult to get within shooting range.

Arctic Raven.—The Northern Raven is a jet black bird with yellow legs and bill. It lives in the high rocky cliffs and plunders every thing within range. It robs the fox-traps, eats the dead carcase of all animals and robs the birds of their eggs. It flies over-head intering a hoarse mournful croak, going its round every morning with clock-like regularity. Although very suspicious, we caught several of these ravens in the fox-traps.

Insects and Mosquitoes.—The insects found at Salmon River included flies, beetles spiders, daddy long legs, bumble-bees, butterflies, caterpillars and mosquitoes. The mosquitoes were black with grey stripes and appeared in clouds on calm, sultry days between the middle of July and the middle of August; at this time mosquito veils and netting would have been very acceptable.

Mushrooms.—We also found some delicious mushrooms growing in a sheltered ravine; Some of which measured four inches across.

Coal.—The Salmon River coal consists of old lignite. The beds run from a few inches to many feet in thickness and are overlaid by beds of sandstone and surface clay. This Coal is in a verv good quality and in a great abundance. The best outcrop occurred about four miles from the river mouth on the west bank, from which we picked out about ten tons to burn during the winter; packing the bags unto dogs sleds and sledding it down the frozen river bed. It was very cold and disagreeable work stripping and mining this coal from an exposed hillside, with a strong west breeze blowing and the thermometer between 30° and 40° below zero. We often froze our hands, noses and cheeks in the process.

Arctic Coal Deposits.—There are also beds of lignite at Canada Point, on the west shore of Bylot Island. Lignite was also found at Cape Hay, Bylot Island. Parry and Liddon discovered coal on the shores of Liddon Gulf on Melville Island. Peat and coal were found near Phipps' Point, 12 miles west of Winter Harbour. Coal was found by chief Officer Green of the "Arctic" in a ravine on the east side of Rood Head, north shore of Banks Land, where a large seam was visible with loose coal scattered over the beach. Coal was reported by McClure in the middle of the west shore of Mercy Bay, Banks Land. Between Winter Harbour and Fife Harbour, Melville Island, coal was found all along the beach, but none was seen in place. The "Arctic" found pieces of bituminous shale on the shore of Chevallier Bay, Melville Island. South of Sargent Point on the east coast of Bathurst Island, a good deal of coal was found by Commander Richards when searching for Franklin, of the ordinary nature and of close jetty nature like English sea-coal. The ground in which this coal was found was between 200 to 300 feet high, consisting of limestone overlying sandstone, between or among which was coal and a calcarous deposit resembling plaster of paris.

In the depressions between the mountains abutting on Eureka Sound on the west coast of Ellesmere Land are in many places, rich deposits of quartz-sand with imbedded strata of lignite. Lignite and masses of slaty coal were also found in Sverdrup in Beaumann fiord. Stenkul (Stone coal) Fiord, and Blaamanden in the west coast of Ellesmere Land,

Bituminous coal was found near Cape Murchison, Lake Hazen, and Lincoln Bay, and Lady Franklin Bay on the east coast of Ellesmere Land, 82nd parallel. Nares reports:—"This deposit of coal is exposed in a ravine for a distance of 300 yards. At its greatest exposure the thickness of the seam is 25 feet but we had no means of telling how much it descended below the level of the stream. The coal was tried by our engineers and pronounced equal to the best Welsh coal. "Above the coal are beds of shale and sandstone.—Lieut. Lockwood reporting on this coal to Lieut. Greely, writes: "The coal is soft and lies in two deposits which are probably connected and form one seam. The coal lies in thin strata".

Small pieces of coal were also found by McClintock on the South shore of Byam Martin Island; and also on the shores of the most southerly arm of De la Beche Bay and on the shore northwest of Scoreby Point, Bathurst Island.

Professor Haughton remarks: "The coal found in the Arctic Islands, excepting that of Tertiary Age at Disko Island, Greenland, presents everywhere the same character. It is of a brownish colour and lingnaceous texture, in fine layers of brown coal and jet black, glossy coal interstratified in delicate bands not thicker than paper. It has a woody ring under the hammer, recalling the peculiar clink of the valuable gas coal of Scotland. It burns with a dense smoke and brillant flame and would make an excellent gas coal; and, in fact, resembles in many respects the celebrated Torbane Hill mineral."

Peat at Salmon River.—There is a quantity of good peat in the Salmon River district.

Copper in the Arctic.—It rained during most of the two weeks we spent at Salmon River and the sound was full moving of ice-pans and young ice. We made one attempt to visit Milne Inlet, with the gazoline launch, in order to visit a spot on the east shore of that sound a little south-east of the entrance to Koluktoo Bay, where native copper was said to exist, but the cedar launch was too frail and her gazoline engine too bulky to push her way through the fields of young ice and pans that blocked the sound about eight miles west of Salmon River.

Samples of the copper from this spot were submitted on the return of the "Arctic" expedition in 1907 to the Government Mineralogist, Mr Robt A. A. Johnstone, who pronounced them to consist of grains of native copper associated with pale apple-green subtranslucent prehnite. We had samples of copper-pyrites and bornite brought to us by the natives from the east coast of Bylot Island and from Canada Point or Navy Board Inlet.—Captain Adams of the whaler Diana, reported having picked up samples of copper rocks on the beach at Clyde River. Green carbonate of copper stains the firm white sandstone cliffs four miles west of the depot at Cape Providence, Melville Island. Copper drift has been found along the shores of Prince of Wales strait, and on Melville Island. In regard to this drift, Professor Haughton writes: "Near Princess Royal Island, in Prince of Wales Strait, and also on the coast of Prince of Wales Island, the copper said to be picked up in large masses by the Eskimos may be supposed to be derived from the Cambrian rocks of the Coppermine River region to the south, as it is not probable that it occurs in place any where in the region of horizontal limestone where it is found". Native copper is said to existe in large quantities in the vicinity of the Coppermine River, which flows into Coronation Gulf and in the small island of the Gulf. Copper might probably be found in the Huronian rocks which border the shores of Smith Sound. No signs of any large copper deposits have, as yet, been found in the Arctic Islands. Among the specimen brought home Hall from Frobisher and Cyrus Field Bays, in the south-east part of the Baffin Island, were bornite, and pyrite showing that copper ores also occur in that portion of the Island.

Return to Albert Harbour.—On September 12th the small pools and the margins of the river and lakes began to freeze and on the 14th we re-embarked in the boats to return to the schooner in Albert Harbour. Trouble was experienced in poling the boats through the ice which blocked the mouth of the river and we managed by hard work to push our way through the ice-pans which covered the surface of the sound until within a mile of the entrance to the harbour, where solid pans blocked further progress. The afternoon was spent in poling the boats and towing them with ropes along the ice-pans, and we often had to use the axe to cut passages between the floes. Our progress was slow and wind from the west bitterly cold. We spent the night huddled together in the open boats shivering from the keen wind and were glad to haul the boats on to the heavy pans at 3 a. m. the next morning we where left them. Taking the flat bottomed punt, which was fitted with steel shod runners, we made our way over the pans to the shore and then rowed across thro open water to the schooner. Caron who had remained by the schooner told us that a few days before, some heavy ice had drifted down upon the ship and threatened to put her ashore. Luckily the anchors hold and by liberal use of poles the danger was averted. We remained on the schooner until September 23d, as the pans which blocked the eastern entrance prevented boat communication with the village. The time was spent in prospecting the hills round the harbour, which consisted of barren gneiss, diorite and garnetiferous hornblende schist, containing no mineral except some small patches of black mica. We had occasional shots at seals and narwhal that were swimming about the harbour, but did not succeed in capturing any. The weather was very variable, at times clear and at others snowing heavily. Young ice kept forming on the harbour, which kept filling and emptying with small pans and loose ice with each change of tide. We saw little of the sun which was dipping lower every day and the high hills surrounding the harbour hid it from view. The view from the schooner's deck was gloomy in the extreme and on shore there was no comfort as the perpendicular hills cumbered with enormous boulders made walking a difficult and dangerous scramble.

Landing Stores for the winter.—On the September 23d the wind after blowing steadily for eight days from the west suddenly changed to the south-east and developed into a gale which soon claered the harbour of ice and removed the ice-jam at the western entrance, allowing us once more free passage to the village in the boats of which we quickly took advantage with the gazoline launch and towing the two whaleboats, which leaked freely and required constant baling, we ran before the gale to the village heavily laden with stores for the winter use on shore. Finding the small cove in front of the village jammed with ice we hastily unloaded our unwieldy cargo of gazoline and kerosine casks, heavy barrels of pork, beef and flour, stoves, bags of salt, coal and lumber on to the slippery and unstable ice-pans which were stained and discoloured with the blood and blubber of a slaughtered narwhal. Helped by the agile and willing Eskimos we stumbled and struggled with the heavy loads over the rough ice to the shores and hauled the two heavy whaleboats high up on the land, out of danger from ice-pressure, the Eskimo women turning out in force and lending a hand with the tow-ropes. We were surrounded by a hundred savage Eskimo dogs that growled and fought all around us over the remnants of the dead narwhal. It was a wild and wintry day with a cold south-east gale blowing and the snow drifted in all directions. Fearing to be stormbound we hurriedly started back in the launch for the harbour. We had a hard fight against wind and sea which several times nearly dashed us on the rocky coast as the engine kept balking and the oars were powerless to keep the boat from drifting, until the engine would start off again. Had we hit the steep shore, not a man would have survived, as the rocks which descend abruptly into the sea, afford no foothold and with the strong tide running, numbed as we were by cold wind and spray, we should have soon succumbed to exposure and exhaustion. After a couple of hours hard struggle we managed to reach the schooner, wet through, cold and with our fingers so numbed that we could hardly hold the oars. A warm dinner in the foc'sle soon restored us and, as usual, our troubles were forgotton as soon as they were over. The gale continued all night with drifting snow, the noise of the waves and the grinding and thumping of the difting ice against the ships sides keeping us awake with the incessant noise. A huge mass of old Arctic ice, over 20 feet thick, blew down upon us in the evening and at one time threatened to drive the schooner anchors and all, bodily upon the rocks that lay close astern. We realised that night what danger beset an Arctic anchorage and that a ship, even in the most sheltered spot, is ever at the mercy of wind, tides and drifting ice.

The next day the storm abated and the weather was calm and clear. We spent the following days until October 2d, in transporting cargo in the launch and ship's boat to the village. The weather was very variable, sometimes calm and clear and then changing to heavy cold south-east gales accompanied with snow that would nearly swamp the boats. One day the harbour and sound would be free and the next, loose ice-pans would be all around us blown in by the east winds. The moment the wind dropped, young black ice would form on the surface of the water through which it was hard work to push the boats. The only day that we saw Eclipse Sound entirely free from ice was on September 27th, which was a fine calm day, with a light west wind accompanied by light flakes of snow. The Eskimos during these days were busy hunting seal in the open waters in boats and kayaks in anticipation of the approach of winter, and some of them came on board every day for a meal of soup, biscuit and tea. They sometimes brought us a seal some Arctic hares or a duck, and fitted us out with sealskin mits boots and caps. On October 2d, we were kept awake all night by the thumping and grinding of a vagrant iceberg against the stern of the ship The next day the ship was frozen in with young ice and some of the men were ferried in the punt across the harbour and made their way on foot to the village by the ravine which runs back of Morin's Mountain where they remained for a week building sleds and fitting them with steel runners, to be traded to the Eskimos. On October 4th the troublesome berg at the stern of the ship was floated by the tide and we gladey speeded it on its way by the aid of long poles. The young ice drifted out of the harbour at the same time. As our water supply that we had brought in casks from Quebec had given out and the streams on the east shore of the harbour was frozen we levied toll on the ice-berg astern of us before it took its departure and the deck was soon littered with huge fragments of fresh water-ice, which we had hacked off the surface of the berg with axes. From this time on we had to depend for our water supply on ice and snow melted in pots and kettles over the stove, until the first week of June in the following year, a period of eight months water for washing purposes was almost unobtainable, and an occasional bath at long intervals was a luxury. Most of the party suffered tortures from lice which appeared in the foc'sle in some mysterious fashion and the Eskimos' igloos and toopiks were infested with these loathsome parasites, especially in the warm summer months.

Young ice forming.—On October the 5th and 6th young ice began to form again round the ship and in two days the whole surface of the harbour was covered with a flat coating of new ice, three inches thick. We sawed a channel through this ice, ahead of the schooner, and hauled her 60 feet further away from the shore so as to prevent her hull from being strained from the up and down movement of the tides and the presure of the ice near the shore. On October 9th the ice was 5 inches thick all over the harbour, except near some open-water seal holes or "swatches" near the eastern entrance. The weather became intensely cold. The Eskimos now paid us regular visits, walking over the ice from the village, in order to get free meals, tobacco and presents of biscuits for their children.

Laying fox-traps.—On the 14th we began to lay fox-traps all round the harbour and by the 21st had caught seventeen foxes, one hare and one weasel. We were much annoyed at night by the hordes of famished Eskimos dogs that came from the village and hovered and howled round the ship like so many wolves, from which they are evidently descendant. These dogs would camp out on the bare ice, exposed to the biting blasts of the winds that constantly blow through Albert Harbour, their bitter intensity being increased by the narrow funnel-shaped formation of the high hills on either side. The dogs would continually keep getting caught in the fox-traps, when walking after the bait, and we were often obliged to crawl out of our warm bunks, at midnight, and cross the ice in the bitter wind in order to free some unfortunate canine that had got caught by the paw and was making night hideous with its anguished howls. The Eskimos lost some sixty dogs in the winter in this manner.

Fox-trapping.—Fox trapping is a favorite and profitable amusement and means of exercise in the Arctic, especially during the long dark and otherwise profitless months of November, December and January. It gives the men something to do and a walk several miles along the traps is necessary to the health of mind and body, although, at first, until one gets broken into the game, it is bitter by cold work handling, the frozen steel traps with bare hands as one can not set the spring without first removing the fingerless and clumsy mitts. The trap used by the Eskimo is usually a single-spring steel one, of which the natives have usually two or three. We took with us and employed over 500 Victor No 2 double spring steel traps with a chain attached for anchoring the traps to a boulder or to heavy boulders of ice. We laid the traps in sets of three, placed round the bait, and all securely anchored by chain and string. The usual bait was seal-meat and the foxes seemed to be unusually attached to a seal head. A black rock is a good mark near a trap as it immediately arrests the attention of the fox, which always mounts on high rocks, hills or ice-bergs from which to survey the scene and to gain a better view of possible food in the shape of ptarmigan, hares, lemming and stray pieces of dead seal or walrus that have been left by the bears or the Eskimos on the ice. The white and the blue Arctic fox are the only kind found in the north, and are much more easily caught than are their southern red and yellow brothers. Probably the intense cold, hunger and difficulty of finding enough game in the Arctic makes them bolder and more reckless. Even when they have lost a frozen paw through being caught in a trap, it is no uncommon thing for them to return to the bait and get caught again. A three-legged fox has not much chance of catching a spiritely hare; and he must take what the gods give him, trap or no trap, or surely perish of hunger. The Eskimos anchor their single traps to a hole cut in a peace of ice with a knife, or, where traps are not available, they construct a long narrow box made of stone or slabs of ice, with the bait in the back part, and attached to a dead fall, so that when it is disturbed, the door falls upon the fox. The most effective manner in which to trap the Arctic fox is to construct a small house of stone or ice slabs, and with the bait put, well back inside, to lay a single steel trap at the entrance, lightly covered with snow, over which the fox must step to reach the bait. But the trap must be securely tied to the ice or the fox will drag it for miles and escape. We have know them to bite through the string and to drag three traps over the rough ice and snow for miles and escape. The principal food for the Arctic fox is the Lemming (a small fur-covered rat) of which the fox refuses only to eat the stomach which they leave in the snow, and which like so many miniature tomb-stones, mark the scene of a tragedy and a fox repast. They vary their diet by eating ptarmigan and Arctic hare, which they stalk from behind rocks and snow covered boulders. The deep, snow-banked valleys are the places to reconnoitre, and, during the winter, it is amusing to study the tale-telling trails which these cute animals make in the snow. The tracks, which their neat little foot pads make in the snow, form a regular lace-work pattern as the fox crosses and recrosses its trail in pursuit of the lemming. The Arctic fox is a beautifully made little animal, the perfection of symmetry, strength and agility combined. Generally throughout the fall and winter the Arctic fox is quite lean, but as the month of March approaches and the sun gets high, they become very fat, living on lemmings and ptarmigan, hares and young seal which they dig out of their snowhouses on the sounds. Their fat is very oily, and lies between the vellum and the hide, but by the end of April it has condensed itself into a form of suet. The fur is at its best during the months of January and February but good pelts are often secured as late as April. This is most likely caused by the winter coat of the young fox developing itself later in the season than that of the older animal, for the winter fur of the matured fox is superior in quality to that of the young. Throughout the winter the edges of the ears and tips of the tail remain darker in colour than the rest of the coat. When about to lose its winter coat, the fur of the Arctic fox becomes wooley and yellowish on the under parts, and the back and tail turn bluish. The brown fur of the summer coat first appears on the face and legs of the animal, and the whitish fur of the back and sides is removed by the fox itself, which it does by rubbing itself against boulders, to which the fur may often be seen clinging. The young when born are of the same colour as the adults are in summer, but the fur is finer in colour and texture. The mother fox shows the greatest affection towards her young, which, when born, have soft and tender eyes, altho expressing at the same time the cunning that is only possessed by that animal.

We were surprised that nearly all the foxes trapped were males very few females being caught. On August 5th 1909 a large Arctic fox was seen swimming from pan to pan in Winter Harbour, in order to secure a meal from the garbage heap on a pan about 300 yards out. The value of the white fox skin is about $30.00 to $45.00 and the skin of the blue fox is worth three times that price.

Leave the ship.—On October 21st after loading our baggage and stores on a number of sleds which the Eskimos had brought from the village, we left the schooner, and walking and running alongside the heavily laden sleds over the frozen waters of Eclipse Sound, reached Salmon River in the afternoon. The day was fine, clear and invigorating and we all enjoyed the walk and our escape from the stuffy quarters on the schooner in the bleak and wind-swept harbour.

At Salmon River.—We camped in the small shack at Salmon River and our quarters were very cramped. Nine men and a dozen Eskimos had to crowd into a small room only 8x12 feet square which contained in addition, 3 bunks, a stove, pots and pans and a small table in one corner, not to mention all our clothes and baggage. Cooking was carried on 2 small gazoline stoves, and the meals were served in relays of three men at a time on the small table. Half of the party slept in the small altic overhead. The first few days were spent in preparing the expeditions that were soon to set out for Arctic Bay and Milne Inlet, and in mining coal 4 miles up the riverbed.

Expeditions Start.—On October 23rd with a cold north wind blowing accompanied by thick fog, Messrs Tremblay and Wilson with two heavily laden sleds and the Eskimos, Tom Lasso and Coonoo and the latter's wife and infant, started for Arctic Bay, where they expected to remain until the following spring. On the same morning, Messrs Chassé and Wm Le Bel, with two heavily laden sled and accompanied by the native, Ooming set out for Koluktoo, in Milne Inlet.

Occupations.—Mr Reader a few days later accompanied by the native Tonga, examined a copper deposit reported to exist in a nighboring sound, but found no trace of the mineral. On November 8th Messrs Reader and John Le Bel crossed the sound and spent six weeks on Bylot Island. living in snow huts with some Eskimos and trapping foxes cf which they caught 40 and saw the only Polar bear seen by the party. It was a two year old male that passed within a 100 yards along the edge of the sound. Having left their rifles at the snow-hut, they were unable to secure the bear, so they scared it way by shouting and the animal desapeared behind some ice in the fog. Mr Caron trapped foxes at Salmon Lake for a few weeks and then spent the rest of the winter at Button Point where most of the Eskimos were congregated, as it is a good place to catch seal near the edge of the open water. Messrs Capt. Bernier and Lawson remain at the Salmon River shack and at Ponds Inlet; where the former carried on trade with the Eskimos, exchanging tobacco, cartridges, (Mauser, Martini Henry, 303 Winchester and 44 Winchester) needles, snowknives, pocket knives, rifles, sleds etc. for foxskins, bearskins, walrus and narwhal ivory, seal oil, sealskins and sealboots.

Christmas and the Dark Days.—The whole party, with the exception of Messrs Tremblay and Wilson, who remained at Arctic Bay, re-assembled at the desolate village of Ponds Inlet for Xmas and New Year, where several hundred Eskimos were also assembled. After the New-Year the party separated for Koluktoo, Button Point and Salmon River. Our Christmas was not a lively one, as the weather was extremely cold, foggy and dark. Our bunks in the house were lined with several inches of solid ice and the floors and ceilling were dripping wet from the continual condensation, of moisture. We did not see the sun for three months and no one, who has not spent à winter in the Arctic during the long months of semi-obscurity, dirt, discomfort and desolation and monotonous period of enforcing inactivity incramped quarters with the thermometer constantly ranging between 30° and 55° below zero can appreciate the feelings of intense longing that comes over one to see once more the pale golden orb rising over the southern horizon and the keen sence of relief and joy that one experience when the cheering rays of the sun enter once more into a fight of supremacy with that gloomy tyrant of the North, King Frost. Another feature of the north is the intense stillness and silence everywhere in winter, as if even the very atmosphere very frozen. Sound travels to an immense distance and one can hear the Eskimos shouting to their dogs seven miles away on the sound often long before they come into sight.

The Artic Moon.—The main consolation, in winter time for ten days in each month is the unusual brilliance of the moon, which stays above the horizon, when full, twenty hours out of the twenty-four and floods the snowy landscape and gleaming hills with a soft luminous radiance that almost equals daylight in its intensity. When the moon is full the tides become extremely high and the sea disrupts the ice along the shores in steep sloping ridges and flood the snow and ice-covered beaches to the very foot of the hills. In these days and nights of high moon the Eskimos travel and visit their traps.

Salmon fishing.—In the months of June, July and August, salmon fishing was carried on at Salmon River and at Janes Creek by means of seines, and over 3000 fine fish were caught and salted in barrels.

Janes Creek.—Janes Creek is about 4 miles west of Ponds Inlet village, and runs back south, through deep canyons and gorges to the foot of the southern range, eight miles away. Its mouth swarms with fine salmon during the month of July; and at the mouth are the remains of an old Eskimo encampment. It devides into two streams a mile or two above the mouth, where there is a small island formed in the bed of the river. Janes Creek brings down a great volume of water for a few weeks in the spring; and as we never explored its channel, we could not say whether the salmon ascended its shallow stream to a lake or whether they only frequented its mouth where there is a fine gravel and sand bottom, for feeding purposes.

Springtime at Salmon River.—No more healthy or delightful spot on earth could be found than Salmon River in the months of May, June, July and August, when the sun is shinning night and day overhead and the air is filled with the sound of rushing streams, the hum of insects and bumble-bees and the song of birds. The ground is carpetted with soft springy turf and moss, delightful to walk upon, and sprinkled with bright Arctic flowers of every hue the air is deliciously clear and invigorating with a cool tang in it that makes walking and exercise a pleasure. The river is full of salmon ; the lakes abound in trout, duck, pluver and geese and the waters of the sound are alive with seal, big seal (oogjook) and narwhal. Across the Sound the high snow-clad peaks of Bylot Island show in dazzling splendour against the clearest of azure skies. With an air-ship to land one in 24 hours from Quebec at the end of May and to take one back at the end of August, Salmon River and many other favoured spots in the Arctic zone would soon become a Sportman's Paradise and a health resort of the first order. At the present time, the journey by sea is too long and too dangerous to over become popular and ships can only arrive in the middle of August, which is too late in the year for sport and pleasure as there is too much ice in the sounds, for boating; and sled travel is impossible until the middle of October. But all things seem now possible of human achievement so far as science and mechanical inventions are concerned, and it does not require a Jules Verne to predict that in a few years, regular lines of airships will be patrolling the Arctic Regions and conveying sportmen, health seekers and tourists to the land of the Eskimo and the midnight sun; the hunt of the musk-ox and polar bear. When this happens, as it probably will, in the not far distant future, it will be necessary for the Governement to reserve great areas of favorite nesting and grazing grounds for the birds and Arctic animals, or they will spedily disappear. Aviation and wireless telegraphy are evidently destined to open up the waste places of the earth, including the regions that border on the north and south poles.

On August 22d, we all left Salmon River, and after a hard day spent in hauling the boats through the ice-floes which emcumbered the Sound, camped for the night at Ponds Inlet. The next day it was snowing heavily and we had much trouble in pulling and hauling the heavily laden boats to within a mile of the schooner, where we were forced to leave them amongst the ice and to proceed on foot over the pans and rocks to the schooner, which lay spick and span in a new coat of paint, ready for the return voyage. Her rudder had been injured by her long incarceration in the ice and the vessel leaked a good deal from the strain to which she had been subjected by the action of the tides, as she had been moored too close to the shore. On August 24th, the wind blew the pans away from the harbour entrance and we paid our last visit to the village, preparatory to sailing for Home the next day. The Eskimos looked very sorrowful as the time for parting approached and some of them wept, they gave us all parting presents of seal caps, mitts and clothing, which their women had made.

All members of the expedition were pleased at the prospect of returning once more to civilisation and cleanliness, as the discomforts and dirt of the past year had become almost intolerable. We regretted however parting with our Eskimo friends as they had done everything in their power, in the most willing and friendly way, to help us to carry out the objets of our visit to their far-off and desolate shores.

CHAPTER III

MR. TREMBLAY'S TRIP FROM PONDS INLET TO ARTIC BAY

Our route.—I left Salmon River at 8 a. m., on October 25th (1912) in company with Mr. Wilson and the Eskimos: Tom Lasso, Coonoo, Coonoo's wife and infant. Our destination was Arctic Bay, in Admiralty Sound, where we were to spend the winter and the following spring hunting, trapping foxes, and prospecting the country round Strathcona and Adam's Sounds for mineral. Our route lay across Eclipse Sound to Bylot Island, round the western side of Bylot Island, up Navy Board Inlet, along Lancaster Sound and down Admiralty Sound to Arctic Bay, a distance altogether of about 250 miles.

Equipment.—We started with two sleds, drawn by 22 dogs, an heavily laden with half-inch tongued and grooved lumber, that had already been cut into proper lengths for the 6 x 6 foot unlined shack that was to be our winter home; and also with barrels containing fox-traps, biscuits, pork, gazoline, flour and other provisions, that we calculated, before starting, would last us for eight months, but which were all consumed before Christmas, as our journey took us twice as long to accomplish as we had estimated, and instead of three we had to feed six Eskimos for a month and were obliged to engage two more sleds at Toolooria to help us with our loads. For arms, I had my 280 H. V. Ross, a 303 Winchester and a Colt 45 automatic Revolver; Wilson had a 303 Winchester and Coonoo a long barrel military Mauser. At Arctic Bay, I gave my Winchester to Coonoo in payment for his services during the winter and thereafter depended upon my 280 Ross and Colt 45 automatic, which I found to be the best arms for exploration in the Arctic.

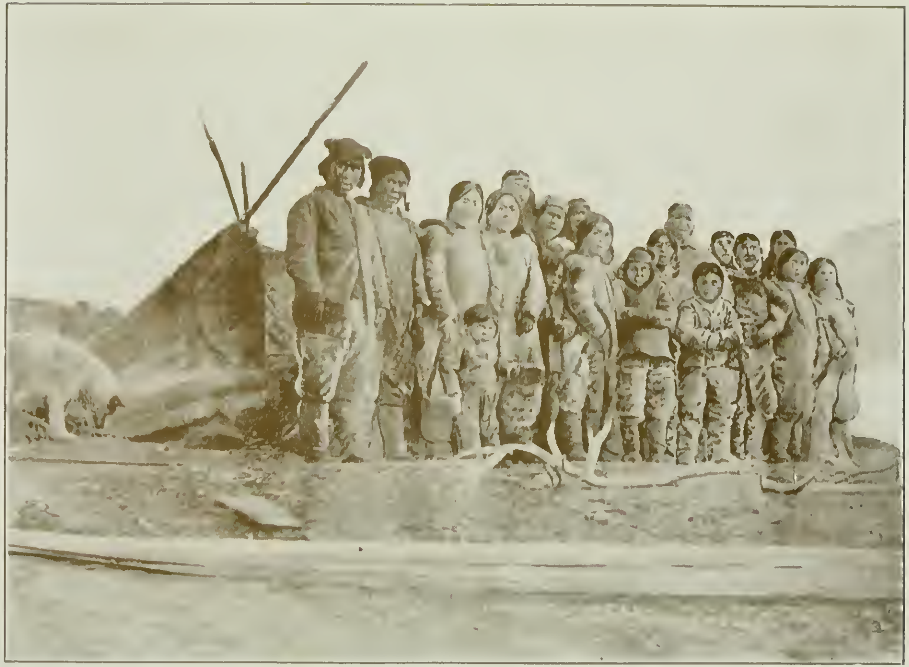
The Start.—We left the shack at Salmon River about an hour after William LeBel and Chassé had started for Koluktoo in Milne Inlet, accompanied by the native Ooming, and two heavily laden sleds on a journey of about 100 miles. We were anxious to reach our trapping ground as early as possible in November, before the days become too dark for travel, and expected to make the trip in twelve days, but the bad condition of the ice at the head of Admiralty Sound, delayed us and we did not arrive at Arctic Bay until November 19th, taking 26 days to make the journey.

We crossed Eclipse Sound, travelling in a north-westerly direction, towards Bylot Island, but, before we had proceeded half a mile, the fog descended and became so dense that our only guide was the light south-westerly breeze that blew in our faces. The fog continued all the day but the sleds travelled well on the newly formed slat-water ice of the sound, which was about ten inches thick and covered with snow. Here and there the ice had rafted where the pans had been overlapped by the wind, and had formed rough ridges of sharp broken ice which made the going more difficult. At one of these ridges, one of the dogs' traces was cut by the ice, and the dog returned to Salmon River. We travelled all day and made a ziz-zag route of about 30 miles in the fog, not knowing exactly where we were going. In the evening, the moon showed up for a few hours through the fog, and by its light we made out the hills of Bylot Island and landed a few miles west of the large glacier lying opposite to Salmon River. Here we built a snow igloo and passed a comfortable night, after a good supper of pork and beans which I cooked on the gazoline stove.

Bylot Island.—Next morning (October 26th) was fine and clear and the sun shined out for a few hours Making an early start we traveled westward along the south shore of Bylot Island. The going was good and the dogs pulled their heavy loads at a smart pace, making about 3½ miles an hour. One of the sleds, being warped and the runners being rusty, did not run well and we felt the loss of the dog that had escaped the day before. We made about 25 miles and camped that night on the S. W. point of Bylot Island. The formation here, from what little we could see of it, was a light-coloured gray sandstone, cut by ravines running generally north and south, with a gravel beach along the shore. During the day we saw the tracks of a 2-year old polar bear that had come down Navy Board inlet and was making for Button Point. The Eskimos can tell by the size and formation of a bear's foot-print in the snow its age and sex.

Toolooria.—On October 27th, we crossed Navy Board Inlet in a north-westerly direction and reached, at about ten o'clock at night, a small native setlement called Toolooria situated in a small bay on its western shore. The day was fine and the ice was smooth but thin and caused us some anxiety for the safety of the heavy loads as we neared the shore. Here we found three Eskimos, living with their wives and families in separate igloos. Toolooria is a good hunting ground for seal, walrus and narwhal and the hills contain caribou, hares, foxes, and ptarmigan. There is also a small salmon river south of the village. The natives were named: Angia-tuktua, Okai and Inuiya. The former's wife was a pretty little red-cheeked, brown eyed woman, whose father was an officer on one of the Scotch

Alfred. Tremblay -



The Eskimos of Arctic Bay, September 13th, 1910.

whalers. She had four children: a fine handsome boy of sixteen and three little girls who formed a pretty picture in their fur hoods and clothing. These little girls were born in Cumberland Gulf, and were said to be the children of another Scotch Captain, which would made them three-quarters Scotch and only one quarter Eskimo. They all had the features and healthy complexions of beautiful white children and had very nice manners. Angiatuktooa was a splendid specimen of an Eskimo, who spoke English and had lived for some years with the whalers. He was a great hunter and traveller, having travelled all round and across Baffin Land and also on Melville Peninsula and the islands of North Somerset and North Devon.

We camped that night in an old snow igloo that had been built and used by Coonoo, when coming from Arctic Bay, a couple of weeks before. We gave the natives small presents of biscuit and tobacco which they were greatly in need of. At Toolooria the gravel shore slopes at an angle of 45° into flat-topped hills which are about 200 feet high and composed of granite gneiss.

Low Point.—We left Toolooria on October 28th, early in the morning and travelled northward along the west shore of Navy Board Inlet, for about ten miles when, the ice becoming rough and crumpled, we camped at Low Point. Here we lost another dog which slipped his harness and disappeared. We left the sleds on the ice, as the tide had piled the ice into ridges along the shore. The formation was the same as at Toolooria consisting of granite gneiss hills.

A handsome Eskimo.—Next morning, October 29th, just as we were on the point of starting at 9 a.m., a native named Ee-ching-ia came up with his sled and dogs from the village of Kilutea, whither we were bound. He was on his way to Toolooria. As he stood before us with the sun shining on his bronzed, ruddy face ; with his sparkling brown eyes and long raven looks, arms folded, fur hood thrown back with a smile that showed his strong white teeth, we agreed that we had never seen a finer specimen of manhood. He reminded us, with his long locks, picturesque costume, enert form and smiling insouciant face, of one of the Chevaliers of France in the olden days rather than a humble Eskimo, who live in a snow hut and depended on his skill with harpoon and rifle to eke out a poor existence in the frozen north. Ee-ching-ia, we learned, was born in Ai-villik and undoubtedly had a strong strain of American or European blood in his veins. When we explained our need of dogs, Ee-ching-ia immediately gave us three from his team as we had lost another dog that morning. Saying goodbye to Ee-ching-ia, we proceeded on our way and shortly after met two more young Eskimos, one of whom was a son of Koonoo and the other a son of Kilutea, the headman of the village whither we were bound. These young men were on their way to pick up a barrel of fox-traps and a barrel of flour that they had brought from Ponds Inlet for our use, and which they had been compelled to leave behind, as the ice was then too thin to bear the heavy loads. We had come accross these barrels on the ice and had added them to an already overladen sled. We transfered some of our loads to their sleds, and then proceeded to Kilutea's village, where we arrived about 7 p. m. The travelling was good and the day fine, but we were delayed at one point by Koonoo's old sled breaking down owing to the pounding of the heavy lumber on the rough ice.

Kilutea's.—When we reached the village, which is about 20 miles north of Low Point, Kilutea, a tall, elderly, powerfully built Eskimo, with a black beard, came out to welcome us, and, with all his men, helped us to unload the sleds and build a snow igloo. He gave us a warm greeting and made us a present of some seal liver for which we gave him some biscuits and tobacco of which they were all badly in need. At Kilutea's I counted ten men, ten women and about a dozen children, who were all living comfortably in snow igloos, pitched about 200 feet from the shore, on the northern side of a wide, shallow bay opposite to Canada Point, on Bylot Island. Kilutea's village is a favorite stopping place for the Eskimos when travelling between Ponds Inlet and Admiralty Sound, as seal, walrus and narwhal are plentiful there, and in the neighboring hills are herds of caribou and Arctic fox, hares and ptarmigan. The Eskimos stop there generally for several days to hunt seal with which to feed themselves and their dogs until they reach Elwin Bay and Baillargé Bay, on Admiralty Sound. The hills that surround the bay rise abruptly some 500 feet to a flat-topped plateau composed of granit-gneiss. On the west side of the bay are five small glaciers, each about 300 yards wide. Opposite Kilutea's on the other side of Navy Board Inlet, is Canada Point on Bylot Island, where extensive beds of lignite coal occur in the hills a few miles back from the shore. South of Canada Point are two small glaciers and a small river, which is said by the natives to have its origin in a mineral spring which does not freeze in the winter time. Just north of Canada Point is a small bay that would provide an anchorage and where I camped later in june 1913. Navy Board Inlet is at this point about eight miles wide.

Kilutea showed us samples of bornite (cooper pyrites) which was evidently taken from pockets in the rock near Canada Point, but as we were anxious to push on we did not delay to do any prospecting for the mineral.

We spent October 30th at Kilutea's and left the next morning at 9 a. m., our party being increased by two sleds which we engaged to accompany us, as our own sleds were too small to carry everything in addition to the lumber for the shack. One sled laden with narwhal meat which we had bought for our dog, was driven by Enoo-ara, a brother of Coonoo's and the other by Oloo-riana, brother of the handsome Ee-ching-ia.

Navy Board Inlet.—Soon after leaving Kilutea's the gravelly hills on our left changed to a light and dark red sandstone, bedded in horizontal layers and dipping slightly to the south. These were surmounted by round gravelly hills which rose about 200 feet above shore-level. This formation continues for about ten miles when it changes into high limestone cliffs. On the opposite shore of Bylot Island, in the neighborhood of Canada Point, the land is much broken and consists of high declivitous hills cut by numerous ravines and backed to the eastward by the high snow-capped peaks of the Byam Martin ranges, some of which rise 4000 feet in height. North of Canada Point, the country along the west shore of the Bylot Island, becomes lower and runs flat out to the north-west point, which abutts on Lancaster Sound, and forms the north-east entrance to Navy Board Inlet.

We covered about 15 miles over good ice, which was rough and rafted in places, and saw the fresh tracks of three Polar Bears in the snow. The tracks were those of a large male with footprints, 15 inches long; female and her cub. We also saw several arctic foxes, one of which Ooloolians caught with his bare hands in a hole in the limestone rock.

We camped that night in a small cove in the limestone cliffs which rose sixty or seventy feet above us.

Adam's Island.—On November 1st, leaving camp about 8 a. m., we travelled over good ice for six hours when we began to meet the rough and rafted ice of Lancaster Sound. Here Wilson and Enoo-ara followed the track of a large male bear, as far as half a mile east of Adam's Island, which lies about two miles from the north-west entrance of Navy Board Inlet. They did not see the bear which was travelling towards the open water along the Bylot Shore, so they turned back. Enoo-ara said that he would go after the bear the next day before returning to Kilutea's, They halted on a small linestone point, waited for me to come up with the sleds, as I had stayed behind to take on some dog meat from a cache further back. They also saw two foxes, when out on the ice after the bear, and Enoo-ara took two foxes from traps which he had previously set on the shore.

We could see the steam rising from the open water in Lancaster Sound, about three miles out from the shore, but could not see the cliffs of North Devon Island, 50 miles away to the north as the fog was too thick.

We proceeded a few miles further and camped in a small bay on the limestone coast in front of Adam's Island.

Enoo-ara's death.—On November 2nd, we did not start untill 11

a. m., as we lost some time in an unsuccessful effort to catch a dog which had escaped from its harness and followed Enoo-ara, who had gone after the large Polar bear, previous to returning to Kilutea's village. This was the last we saw of poor Enoo-ara, as we learnt afterwards at Arctic Bay, that he had died the day after he reached his home at Kilutea's as a result of eating too much frozen seal meat after his prolonged fast when on the bear hunt. Coonoo, his brother, when he heard the, news at Arctic Bay, was terribly upset and would tramp by himself up and down outside in the snow, and would climb the hills calling the Enoo-ara's spirit. We also felt Enoo-ara's death keenly, as he was a first rate hunter and a most agreeable companion. Enco-ara was about 35 years of age and left a young widow and a small child.

Lancaster Sound.—We had sent a letter by Enoo-ara to be delivered at Ponds Inlet, in which we reported finding open water at Lancaster Sound and asked that more provisions be sent on after us, as soon as possible, as we feared that we might be detained on the route. Owing to Enoo-ara's untimely death this letter was never delivered. We travelled westward along the shore of Lancaster Sound over ummocky and rafted ice which was about 8 inches thick. The open water was about 3 miles distant on our right. Towards the end of the day's march we came upon an intrusion of dark red sandstone that extended along the shore for a couple of miles. That night we camped in a small valley, between the low limestone hills, which were about 20 to 30 feet high near the shore. A small creek entered the shore at this point, but was, of course, frozen solid. We obtained our drinking water from the fresh water bergs which were scattered along the shore. The weather was fine and we had had but little wind since leaving Kilutea's, the air was filled and obscured by the light mist that kept rising from the open water on Lancaster Sound.

On November 3rd, we travelled well as the ice was not too rough. The shore consisted of light-coloured limestone which varied from 5 to 40 feet in height, rising in places to 150 feet. At some places holes and small caves had been hollowed out of the rock by the action of the water. We reached some gravel hills about 4 p. m. and camped in a deep gully where we had trouble in finding snow deep enough to make an igloo. One of our lost dogs returned.

November 4th, we started at 8 o'clock in the morning and when crossing a wide shallow bay that was surrounded by round gravel hills, encountered very rough ice and a bitterly cold southwest wind, that nearly froze our hands and faces. About 3.30 p. m. we came to a long, low gravel point. Here there was a narrow portage, about 100 feet long, from the gravel shore to the east

Iceberg in Lancaster Strait

Adam Sound.

end of a lake, which lies east and west, 2½ miles long by ½ mile wide. The lake seemed to be a succession of shallow ponds. By following the lake we avoided the rough shore ice which surrounded the low point. We camped on the left end of the lake where we found plenty of good snow with which to build an igloo. Back of the lake outcrops of limestone show through the gravelly hills. The days were now getting very short and the sun rose only for a few hours over the distant southern horizon, and there was no moon. This fact coupled with the thick fog that arose from the waters of Lancaster Sound, compelled us to make only short journeys every day.

On November 5th we lost another dog before starting. We crossed over the portage, which consisted of a low gravelly bank, about 200 feet long between the west end of the lake and the shore. The dogs had hard work to pull the heavy sleds over the gravel which was almost bare of snow. After reaching the shore we travelled well south of west, until 3 p. m. when we struck open water and were compelled to make for the shore and camp. We had to tramp the soft snow with our feet for over an hour in order to make snow-blocks for an igloo. The south-west wind blew biterly cold in our faces all day. When making for the shore the heavy sleds skidded, slipped, and bumped over the slippery and uneven hummocks of ice and both Wilson and I, when helping to steady them, nearly had our legs caught under the runners. Had this occurred we should assuredly have had our legs broken under the sharp steel shod runners and heavy loads. In 1911, when travelling with the Eskimos round Cape Crawford, I saw Izzikakto's son have his leg broken in the same way. Twice our sleds upset as they slid over the polished hummocks. The shore we passed that day consisted of black shale rock, which occurred in low perpendicular beds about 5 feet high capped by round gravelly hills which rose 75 to 100 feet above sea-level. A mile back from where we made our igloo was a small hill of limestone, covered with gravel, and intersected by a sharp ravine through which a small creek ran into the sea. Three miles further back from the coast was a high ridge (about 1500 feet high) of rocky hills which appeared to be composed of gneiss. We remained at this spot on November 6th, as there was open water ahead of us, and that ice there was along the shore and not strong enough to bear the sleds. In the morning we walked along the shore, which consisted of gravel hills, with no rock visible, to a small point for the purpose of examining the ice, but seeing no way to get past returned to camp, shooting a couple of hares on the way back. Ooloorianа complained of feeling ill and remained in the igloo all day. Tom Lasso and Coonoo went hunting for seal on the ice as our supply of meat was running short, but they did not kill any. The weather was fine with little wind. The night was very cold and the ice was making fast on the shore.

Thin ice.—On November 7th, we took two light loads over the young ice, which was only 2½ inches thick and covered with snow, to the point that we had visited the day before. We wished to test the ice and in order to lighten the loads took them by detachments. It was easy travelling over the smooth ice, which was very weak in spots and a man had to walk ahead to test it with a harpoon. The wind from the southwest was bitterly cold and so strong that we had to weigh down the stores that we left at the point with lumber and stones. In our absence, Oolooriana had built a new igloo, as the one we had built with rotten snow had fallen in on us during the night and smothered all our things with wet snow.

We suffered a good deal when building our snow igloos every night at the end of a long march, especially when having to spend an hour or two trampling the soft snow till it could be made into blocks which continually broke and filled our clothes with cold wet snow, while the cold wind chilled us through in the process.

The following day (November 8th) leaving camp about 9 o'clock in the morning we travelled another six miles to the southwest. The wind was cold from the same quarter and the pans of thin ice kept sinking under water with the weight of the sleds. The dogs, getting frightened would stop, and we were often obliged to jump into the water and with a liberal use of the long whips, force them on before the sleds had time to sink with the thin pans. Finding some good snow in a small ravine with a huge granite boulder marking its position on the shore, we built an igloo and spent the night. A dog which had left us the third day before, returned to camp. The country all around consisted of low gravel hills.

Dangerous work.—On November 10th, starting early, we travelled over a number of small moving ice-pans that were driven before the wind from Lancaster Sound. Large cracks in the ice kept opening and closing all around us. We had to keep the frightened dogs continually moving under the whip from one sinking pan to another or we should assuredly have lost our loads through the thin ice Our position the whole day was one of discomfort and danger as a very strong cold wind was blowing and we were continually walking in the water or jumping from one pan to another Darkness was coming on and we did not know whether we should be able to reach the shore or whether at any moment sleds, dogs and men would sink through the fragile and crumpling pans into the icy waters of the sound. At 2 p. m., we came on a huge crack on the ice floes, about 300 yards wide, near the Entrance of Elwin Inlet, that ran out into

Admiralty Sound, at right angles to the shore. We made for the shore and when passing over the rough and crumpled ice near the beach, one of the sleds overturned and nearly broke my leg. We then tried to cross the mouth of Elwin Inlet, but the ice in the middle of the bay was all broken and heaved up into huge cakes, which made further progress, in the dark, impossible. So we camped that night in the middle of Elwin Inlet, and having no snow with which to make an igloo, selected an overhanging cake of ice and under it made a rough shelter of boards packed with snow, through which the north wind swept in blasts all night. After a scanty tea, made by Coonoo's wife, we crept into our frozen sleeping bags and tried to forget our misery in sleep. But the bitter winds swept through our flimsy, ice-cold shelter and we had no sleep that night. Tom Lasso and Coonoo sat huddled up in their kulitangs and Coonoo's wife sat up all night with her eight-months-old child trying to nurse the fire and to keep her shivering and crying child from freezing to death. So cold was it in the shelter that the sick Oolooriana went outside, and we could hear him walking up and down all night on the ice to keep warm Mr. Wilson was the best off in his feathered-lined sleeping bag as I had only a sealkin bag with a thin blanket provided by the expedition. The sealskin sleeping bag is a thing to be avoided as it gets wet through with the snow and then freezes into a solid cake, and in order to get into it at night one has to first thaw it out with the heat of one's body and then crawl gradually into its damp and claming folds. The night was very cold and certainly registerd 30 degrees below zero. The cold was more intense owing to the bitter north wind that howled around us. We saw the fresh tracks of a male Polar bear close to the large ice-crack that we had passed before reaching Elwing Inlet.

Good-humoured Eskimos.—Next morning (November 11th) Wilson and I were in bad humour consequent on the cold, sleepless and unconfortable night that we had passed, but the Eskimos, including the woman, who had certainly passed a more anxious and more unconfortable night than we, were all in the best of humour and treated it all as a good joke. The patience and good humour of these hard-living people is a marvel to all white people who come in contact with them. Accidents and annoyances, that would throw a white man into a paroxysm of rage or despair, the Eskimos will treat as a matter to laugh at and proceed to remedy with the greatest of composure and good-nature. They have the happiest philosophy in the world, and needless to say, they need it.

We made an early start as everybody was cold and wished to get warm by moving. The day was fine and the wind had dropped.

We had not gone far when we came on another large crack in the ice, several hundred yards wide, with three large seal disporting themselves in the chilly waters. Coonoo shot two of them and we spent a long time trying to recover their floating bodies with a harpoon attached to a line. But they were too far out beyond reach, so we left them and marched on across Elwin Bay over very rough ice. Our progress was slow and we were continually engaged in holding the sleds to prevent them from overturning. We also were kept busy freeing the dog's traces which kept catching in the sharp edges of the ice. Crossing Elwin Bay, we ran on to another huge crack in the ice, about half a mile wide, which ran out at right angles a long way from the shore Further progress being barred, we camped on a low sand pit about half a mile south of Elwin Inlet.

Elwin Inlet.—The north and south shores of Elwin Inlet consist of banded layers of light-coloured and red sandstone which form abrupt cliffs some 1500 feet high. We found the remains of a former native encampment on the sand and gravel beaches on each side of the entrance, as seal are plentiful there and in summer time it is a favorite spot for hunting walrus and narwhal. Fox-tracks were plentiful, as wherever there are old camp sites, igloos or caches the foxes congregate in search of food and these are good places to set traps. Elwin Inlet is said by the natives to be about fifteen miles deep. About a mile to the south there is a deep valley, about a mile wide, with steep sloping sides of sandstone. Down this valley a river runs from the east to the sea. The river is about 100 feet wide with steep sloping banks and its bed is strewn with large boulders. Some water was running in the river-bed when we passed. Eight or nine miles further south is Baillargée Bay.

On the morning of November 12th, Coonoo and Oolooriana, went back with a sled to recover the seals that Coonoo had shot in the ice-crack the day before, as the dogs had had hardly anything to eat for four days. Wilson, Tom Lasso and I, took a sled with a half load along the shore of the foot of the high sandstone cliffs, in order to see whether it was possible to get past the large crack in the ice that lay to the south of us and which cut off our progress. We travelled about two miles, when we found that the ice was piled up huge lumps against the face of the cliff and was crossed in all directions by deep cracks and fissures. We returned to camp where we found Coonoo and Oolooriana who had succeeded in recovering one of the dead seals. So we gave the hungry dogs a scanty and much needed meal.

Tom Lasso's bath—We remained at this camp four days as the ice-cracks barred our progress. On November 13th, Wilson and I, with Tom Lasso and Coonoo, climbed the sandstone cliff behind the camp to see if the large crack had become frozen over but it was still open. Tom and Coonoo then went after seal. They shot one, and Tom returned to the camp for the shovel with which to cut off a lump of ice to serve as a raft, on which he preposed to float out to the dead seal and affixing a harpoon and line, to draw it ashore. Tom cut a large piece of ice from the edge of the crack and, boarding it and using the shovel as a paddle, reached half way to the floating body of the dead seal, when the ice-raft, which was too thin to stand the strain broke into pieces under his weight, and he fell, deerskin-clothes and all, into the water. Fortunately he had the harpoon in his hand, to which a line was attached with Coonoo at the other end, as Tom could not swim and would otherwise certainly have been drowned. Coonoo pulled him out. Tom tried to save the shovel by putting it between his legs, but it slipped and sunk. Tom then ran back to the camp, two miles away, and arrived there almost frozen, with his teeth chattering and shivering in every limb. We stripped off his soaking clothes and gave him some dry clothing and he soon recovered his accustomed gaiety. Wilson went out after some hares and brought back a fox which he had shot.

The next day Tom, Coonoo and Mr. Wilson walked along the shore to see whether there was any possibility of crossing the crack, but finding it still open, returned to camp. Wilson then walked to the entrance of Elwin Inlet to look at the formation and found it consisted of sandstone which in places ran into shale, but there was no sign of mineral.

Tremblay Mountain.—On the 15th, Wilson and I went after hares and each taking a side of the river, ascended the valley two miles from its mouth. I climbed up a flat-topped mountain, that rose 1500 feet on the south side of the valley, in order to get a good view of the sound to the south. I had a terribly hard and dangerous climb, having to cling on to the steep face of the hill to prevent my being carried down hundreds of feet by snow slides. At times, I nearly slipped backwards, but retreat was impossible and the only hope of salvation was to go on climbing until the top was reached. As I neared the top darkness came on and Wilson returned to camp. On reaching the top I fired four shots at a hare in the dusk and left the empty shells, with my name and the date on a piece of paper, under a small cairn of stones as a record. I named this hill Tremblay Mountain. I was fortunate in finding a long steep ravine on the other side of the mountain, as I could never have returned by the way I came. As it was I had a hard time and many bad falls in slidding gravel and snow before I reached the valley. I reached the camp, several hours after Mr. Wilson, with my clothes all covered with gravel and snow from frequent falls in the dark. The Eskimos never expected to see me again alive when they learnt where

I had been. Although we saw some hare and ptarmigan in the valley, we shot none, as the light was too bad.

Tom, Coonoo and Olooriana had spent the day repairing the sleighs in order to be ready to leave in the morning as the large crack showed sign of closing. The weather was fine with hardly any wind.

On November 16th, we loaded up the sleds and leaving camp about 9 a. m. we started to try and cross the big crack which had shown sign the day before of freezing over. Coonoo went ahead with his harpoon to test the strength and thickness of the ice and we managed to get across, although the newly formed ice was very thin and weak in places and the harpoon pierced it easily.

A dangerous place.—We had no sooner crossed this crack when a north wind sprang up and it began to open again, cutting off all possibility of a retreat, and we advanced over the smooth pans for about five miles when another large crack, 500 feet wide, opened in front of us and ran from the foot of the high cliffs out into the sound. Our position was now a most unpleasant and dangerous one. In front and behind us were impassable cracks, on our left, huge beachless cliffs, which offered no foothold or shelter and on our right, three miles away were the open water of the sound. The ice-pans, which were only 8 inches thick, were being driven before the wind, crushed together and blown apart with increasing violence as the wind grew into a gale. We saw several seals in the ice-cracks, but had no time to spare for hunting them. Leaving the sleds on the pans, we first made for the shore hoping to find a passage, but the steep cliffs that were fringed with crumpled ice-pans offered no hope in that direction. Returning to the sleds we noticed that the crack was closing in slowly about two miles out from the shore, where the strong wind was driving the pans together.

We signalled to the sleds to follow us and as the edges of the pans came together, one pan sliding or "rafting" over the other, we hurriedly crossed the sleds on to the overlapping pan. After that we made good progress until 4 o'clock in the afternoon, when the ice began to get very thin and the wind increased to a gale. It was also growing dark. The pans were cracking, grinding and rafting all around us and if we allowed the sleds to remain too long in one spot the thin ice pans would slowly bend under their weight and commence to sink. Our position was growing more dangerous and desperate every minute, as the farther we went the more rotten became the ice and the gale kept tearing the pans apart and crushing them together again with terrific noise and force; the cliffs offered no security and darkness was creeping over everything. The noise of the crushing and grinding pans heightened our sense of the danger. Pushing on we came to a place where the ice was so thin and rotten that the sleds began to sink though the ice into the water, and several times my foot went clean through the ice into the water. The dogs all stopped and the Eskimos becoming thoroughly frightened started to loosen the dogs from the sleds, thinking that the sleds were doomed and must abandoned. Shouting to them, I whipped up the dogs and forced the settling sleds into motion once more and, taking a desperate chance, headed them over the rotten ice for the shore, in the hope of the ice getting stronger inshore and or being able to find a niche in the cliffs. The wind kept increasing in violence and the noise of the grinding pans was deafening; it was almost completely dark and we could not see two yards ahead. But luck was with us, and we had not gone a couple of hundred yards when we struck solid ice at the mouth of Baillargée Bay, and, striking in for the shore, at the northern entrance of that sound, found a sloping beach at the foot of the cliffs with plenty of good snow to build an igloo. As we reached the shore we heaved a fervent sigh of relief and felt that we had had a narrow escape, and were thankful that we had escaped not only with our lives but with our sleigh-loads as well. When hunting around an old cache looking for good snow, from which to make blocks for the igloo, Tom found a fox in the cache and choked it to death with his hands. We passed a good night in the solid snow although a cold gale from the northwest was howling outside.

Baillargée Bay.—The hills at the entrance to Baillargée Bay rise in abrupt cliffs, 1500 feet high, above the waters of the sound and are composed of red and light-coloured sandstone. They are flat-topped and terraced, with, here and there, square isolated blocks, that give them the appearence of an old castle or turretted fort. On the southern side, the cliffs are beautifully rounded and rise plumb out of the waters of the sound, and so evenly set are huge rectangular sandstone blocks that they appear to have been constructed by the hand some giant mason.

Baillargée Bay is somewhat narrower at the entrance than Elwin Inlet, being about two miles wide. The natives, who go there regularly to hunt, told us that it runs about 20 miles inland. On the north side of the entrance, we found an old cache, which showed it to be a good hunting ground for seal,walrus and narwhal.

On this day we saw the sun for the last time, and beyoud a few short hours of twilight, were to see no more sunlight until the fifth day of February.

November 17th, was a fine day with a cold south wind blowing in our faces. And as neither Wilson nor I, had any deer-skin clothes at that time, we felt the cold keenly and our hands suffered especially. We started early and crossing the mouth of the sound made a good day's march to the south. Wilson, Coonoo and I walked ahead, Tom and Oolooriana following with the sleds. We came on some fresh sled-tracks in the afternoon, which cheered us greatly, as it was the first indication of human beings that we has seen in this desolate and forbidding region.

Admiralty Sound.—The character of the shore gradually changed as we left Baillargée Bay behind us; the sandstone gradually changing into low gravel hills. At 4 p. m., we came upon a large boat, about 30 feet long which was drawn up on the beach, and which proved on closer inspection to be an old gazoline launch, with her engine removed, that had been abandoned by the "Neptune" last September. She belonged, we were told, to the wrecked "Algerine" and after being towed round here, had been abandoned as an encumbrance.

Nearly on top of the low flat hill we found a pile of one inch tongued and grooved lumber, with some 3x6 " scantlings, which had also been left by the "Neptune" with the idea, no doubt, of building a shack; but I suppose the prospectors, after viewing the country, had decided against spending a year's prospecting in this remote and desolate region.

Eskimos Summer Camp.—We were now about half way between Baillargée Bay and Strathcona Sound, which are some 20 miles apart and this spot is a favorite summer camp of the Eskimos of Strathcona Sound and Arctic Bay, where they hunt seal, walrus and narwhal.

We camped here on a flat beach and found some fox-traps which had been set by the natives of Strathcona Sound. The dogs kept constantly being caught in these traps, as they were so hungry they could not resist the pieces of meat that were placed near the traps for bait. We kept crawling out of the igloo at intervals during the night to release the howling dogs as they got in the traps, and our hands were nearly frozen with handling the cold steel.

Chief Lasso.—At this spot, old Lasso, Tom's father, the white-haired chief of the Arctic Bay natives, was buried, he had died shortly after the visit of the "Neptune" to Strathcona Sound, in the Fall. Old Lasso was a fine stern figure of an Eskimo, a great walrus hunter and was greatly feared and respected by the other Eskimos. He had killed several male-factors, it was said, with very little compunction. One of them he found crawling one night near his igloo, and driving his harpoon throuhg the man's body, who was a well known thief, called the other Eskimos out of their igloos, and, pointing to the dead body, said he had taken it for a seal in the darkness. His action was promptly commended. Tom only learnt of his father's death when we arrived the next day at Strathcona Sound.

Strathcona Sound.—November 18th. Before starting we had a good deal of trouble with the hungry dogs which would keep rushing for the bait and getting caught in the fox-traps, and we had hard work to get them harnessed to the sleds. We rounded Strathcona Point and by noon reached the native village, which is pitched on a small gravelly beach about two miles from the point. The point consists of low gravel hills, which are backed by high sandstone mountains about 1200 feet high. Strathcona Sound is seven or eight miles wide at the entrance and runs 30 miles to the eastward, dividing into two arms at the far end of which the southern branch takes a turn south and reaches the same latitude as Arctic Bay. The village contained 5 igloos which were inhabited by old Lasso's widow, old Lasso's sons, Etotah and Peewiktoo, with their wives and children, Kakkio, Akwino, and Kakto, also with their wives and children, about 20 in number. We remained about an hour talking to the natives, but did not enter the igloos. Tom Lasso here learnt for the first time from his mother, an old lady with much autority in the village, of the death of his step-father, old Lasso. Tom did not seem much affected by the news, as old Lasso who was only his step-father had married his mother when he was a small boy. Akwino's wife, Pakka was also a daughter of old Lasso. Here I met Peewiktoo and his quaint little wife, Tootillik, who afterwards accompanied me in all my wanderings to Igloolik and Melville Peninsula. I had know Pewiktoo before, when I passed the winter of 1910-11 at the Arctic Bay with the Government Ship "Arctic". Peewiktoo and Coonoo had accompanied Mr. Lavoie, the Government surveyor, when he made his trip across Brodeur Peninsula, down Prince Regent Inlet to Aggo and returned overland from Aggo to Scheming, and then by way of Moffet Bay to Arctic Bay. Mr. Lavoie had his face and hands badly burnt by a gazoline stove in Moffett Bay and probably owed his life to the devotion of Pakka, Peewiktoo's sister and Coonoo's wife, who tended him carefully, even licking his face in order to clean it from poisonous matter. Tootillik when she heard that the schooner was going to spend the winter at Ponds Inlet, clapped her small hands and danced with joy, as it meant dancing, music, biscuits, molasses, needles, ribbons and beads for the women and cartridges, knives, rifles, and tobacco for the men; which things constitute the principal requirements and pleasures of the Eskimos.

Victor Bay.—Leaving the village at one o'clock, we crossed Strathcona Sound over fine smooth ice and reached the entrance of Victor Bay, about ten hours later. We noticed at the western entrance of Victor Bay an outcoop of diabase that cropped out from beneath the overlying sandstone. We continued down

Victor Bay and over good ice to the southern extremity of the bay, where we camped on a flat beach.

Victor Bay is about 4 miles deep and 3 miles wide with an entrance about 3½ miles wide. It is a fine bay but is exposed to the north winds which drive the icebergs and pans into the bay thus rendering it an unsafe anchorage. The bay is surrounded by low hills of sandstone, limestone, sand and gravel with occasional outcrops of diabase. There is a long reef running out from the western point of Victor Bay which is very dangerous, as it is not marked on the chart. This point should be given a wide berth. The coast west of Victor Bay is very low.

Victor Bay is separated from Arctic Bay, which lies to the south, by a low saddleback of hard limestone, much broken into sharp-edged stones and gravel, which is very troublesome to walk over. This ridge is about two miles wide and from two to three hundred feet high.

Reach Arctic Bay.—On November 19th we made an early start on the last lap of our journey, and we took only half loads as the ridge between the two bays was too steep for full loads. The descent on the south side was so steep that we had to unharness the dogs and lower the sleds down the slope with ropes. We crossed Arctic Bay on the ice and, hauled the sleds over a quarter of a mile of low flat gravelly beach on the west shore of the bay to a fresh water lake, which lies between Arctic Bay and Johnston Harbour. This lake which I named, Arctic Lake, is about two miles long by ½ a mile wide. We pitched camp about 7 p. m. on a little bay in the centre of the north side of the lake. We passed the night in an igloo, and the next day, Tom Lasso, Coonoo and I went out seal hunting as the dogs had had nothing to eat for five days, and Wilson and Oolooriana went back for the remainder of the loads which we had left at Victor Bay. Not getting any seal, I sent Tom that night to the village at Strathcona Sound to get some seal meat from Etotah with which to feed the dogs, which were so weak they could hardly pull the sleds. On November 21st, Tom returned with two seals and we gave the dogs a good meal, eating some of it ourselves. We spent the day putting up the wooden shack, which was to be our winter headquarters. The next day we surrounded it with snow blocks and built two adjoining snow igloos alongside, in which we stored our traps, fuel and provisions. We moved into the shack which was only six feet square and 6 feet high and which contained also two bunks and our gaxoline stove on a box. We did all our cooking, sleeping, eating and drying of clothes in this small space and into it would crowd at the same time half a dozen Eskimos from Strathcona Sound, who frequently came to visit us and get an occasional meal. The shack leaked badly as the heat of the stove condenced the frost and snow outside and the water would pour down on us night and day. We often felt that we would have been better off in a snow igloo, confortably lined with sealkins such as the Eskimos used.

Tom and Oolooriana left us that day to return to Ponds Inlet after spending a few days at Strathcona Sound, and we sent a letter by them requesting that more provisions be sent as soon as possible. We did not received these provisions until after Christmas, when we had completely run out of provisions and gazoline, and were compelled to borrow some seal from Etotah or we should have starved before the fresh supply reached us.

CHAPTER IV

ARCTIC BAY AND ADMIRALTY SOUND

Fox-trapping.—We spent the dark days of December and January at Arctic Bay trapping foxes: we laid traps round the shores of Arctic Bay and Johnston Harbour. We caught only 13 foxes in that neighborhood, as the animals had been thinned out by the heavy trapping carried on by the "Arctic" when she wintered in Arctic Bay in 1910-11, and also by the Eskimos that live at Strathcona Sound.

Prospecting.—We made several flying trips to Adams Sound, Johnston Harbour, Victor Bay and Strathcona Sound, but as the weather was so dark, foggy and intensely cold, and the land covered with snow and ice, it was difficult to do much in the way of prospecting or to make more than a perfunctory examination of the rocks in those localities.

Arctic Clothing.—During those trips we were accompanied by the Eskimos, Peewiktoo, Koonoo and Kakkio, whilst their wives and old Lasso's widow made us kulitangs, trousers, socks and mitts of caribou skin, of which we were greatly in need of. Mrs Lasso also knitted us some splendid wooleen mitts from wool that we gave her, as she had learnt the art of knitting from the Scotch whalers that used to visit Admiralty Sound.

Christmas.—Just before Christmas our stock of provisions was exhausted, as also our stock of gazoline. We did not passed a very merry Christmas; our Christmas dinner consisted of a little flour and grease that we cooked in a frying pan over a kerosine lamp. After that, we borrowed some seal-meat and blubber from Etotah, at Strathcona Sound, who, fortunately, could spare us a little. We were beginning to get very anxious when some more provisions arrived from Ponds Inlet on December 30th which were brought by Attita and Nooyeeso. The small shack leaked badly as the snow and frost on the walls and roofs kept condenseing from the heat of the lamp and the gazoline stove, and bedding and clothing were continuously damp from the drippings of the roof. We got out drinking and cooking water, which was of the best, from the lake, in the surface of which we cut a large hole and which we kept from freezing over by packing with snow. We built a snow igloo over the water hole to protect it from the dogs.

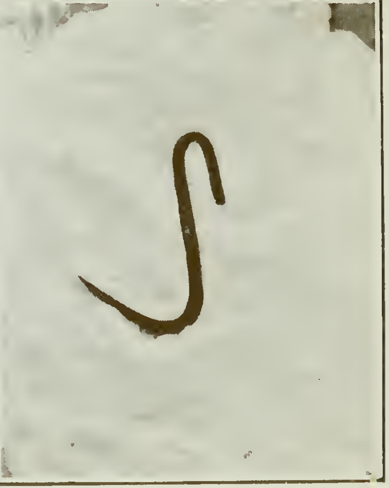
We did not see the sun for nearly three months, until the 5th of February, and the days were long, dark and depressing. At Christmas especially, we felt as if we were abandoned on the frozen rim of the world. Inside the shack was dirt, gloom, discomfort, and irksome inaction; while outside was nothing but bleak, black rocks, snow and ice-covered desolation, wrapped in dense fog and accompanied by an intense, biting cold that would not allow itself for one moment to be forgotton. The north wind howled round the shack in bitter blasts, often accompanied by whirling blizzards of snow. To add to our discomfort we were uncertain whether our provisions would be able to reach us from Ponds Inlet in time, as the long silence which had ensued since the requisition which we had sent by Tom Lasso was making us very uneasy.

The temperature during those two months of constant storm and darkness ranged between 30° and 56° Fahr. below zero.

Arctic Bay.—Arctic Bay is a fine harbour, circular in shape, with a diameter of about 3½ miles. It is encircled by high mountains to the north and northeast, and affords splendid anchorange for all the ships. There is good holding ground all over the harbour. The "Arctic" anchored for the winter of 1910-11, in 15 fathoms of water, about 500 yards from the northwest shore. The entrance is from Adam's Sound, on the south and is 1½ mile wide, with a sloping rocky point on each side. A ship, when entering the harbour, should keep to the middle of the passage, as the water shoals near the rocky points at either side.

Johnston Harbour.—Johnston Harbour is in Adams Sound about 3 miles east of Arctic Bay and forms a fine circular Bay, about a mile wide and two miles long from N.-E. to S.-W. The entrance is about ¾ mile wide. There is good anchorage for ships especialy on the southeast side, where the water is deeper.

Rock formation.—The rocks round Arctic and Victor Bay consist of diabase and gabbro, overlaid by limestone and gravel. The rocky hills between the lake and Adams Soundsare about 300 feet hight and consists of gneiss. On the south side of Strathcona Sound, about 20 miles east of Victor Bay, there is a large vein of iron pyrites, which is very rich in sulphur and contains traces of platinum. This depot is at the mouth of the small stream



1—SS. "Arctic" heading North for the Winter, Arctic Bay, Oct. 1910.
2—"Arctic" at 1 a. m., July 1910.
3—Ice anchor from Capt. W. E. Parry 1822-23, discover at Igloolik, by Alfred Tremblay, March 1913.

1 Eskimos deserted village Adam Sound.
2 Snow Igloo, Arctic Bay village.

which runs into the south side of the sound, opposite Chassé Island and English Bay. There is good anchorage in 7 or 8 fathoms of water, near the shore opposite the outcropping of this mineral.

Borden Peninsula.—The long peninsula that lies between Admiralty Sound and Navy Board and Milne Inlets, I named Borden Peninsula in honor of the Prime Minister of Canada. Borden Peninsula is very mountainous, with small glaciers filling its seaward valleys and is pierced by many deep fiords, above which the high encircling snow-topped mountains, rise dark and forbidding. On the peninsula, many varieties of rock occur including gneiss, granite, diabase, diorite, gabbro, sandstone, limestone, shale (yielding shale oil) and gravel. In Tremblay Sound at the western head of Milne Inlet, are numerous veins of quartz, some of which contain copper and iron pyrites. Silver was reported to have been seen in Strathcona Sound and Moffet Bay. Copper pyrites, bornite, iron sulphides, containing traces of platinum, rock crystals, fluorspar and graphite are also found. The northern shore of Borden Peninsula which fronts on Lancaster Sound is very rough and broken, rising in the interior to a general elevation of 2000 feet. The Eskimos travel occasionally across Borden Peninsula, from the head of Strathcona Bay to Tremblay Sound and from Scheming to Koluktoo. The Ponds Inlet natives also wander up the centre of Borden Peninsula from Koluktoo and Tremblay Sound in the summer timein search of caribou and other game. The rivers contain salmon and the hills abound caribou, white fox, ptarmigan, wolves and birds. The various sounds and bays are frequented by seal, walrus and narwhal. At Koluktoo, Toolooria, Kiluteas, Strathcona Sound and Scheming are native camps, each containing about four Eskimo families.

Admiralty Sound.—Admiralty Sound runs, generally, due south from Lancaster Sound for a distance of 200 miles to the 71st parallel and has a width of 15 to 25 miles. The eastern shore is indented by the following large bays or fiords: Elwin Bay, Baillargée Bay, Strathcona Sound, Adams Sound, Levasseur Bay, Moffet Bay, Vanasse Bay and Berlinguet Bay. At the southern end are two large bays, south of Scheming, which I have named South Bay and West Bay. The west side of Admiralty Sound, bordered by Brodeur Peninsula, consist of flat-bedded, limestone cliffs, which rise about 1000 feet to a comparatively flat plateau, which descends in altitude towards the west, along the eastern shore of Prince Regent Inlet. The west shore of Admiralty Sound is unbroken by any large bays and sounds.

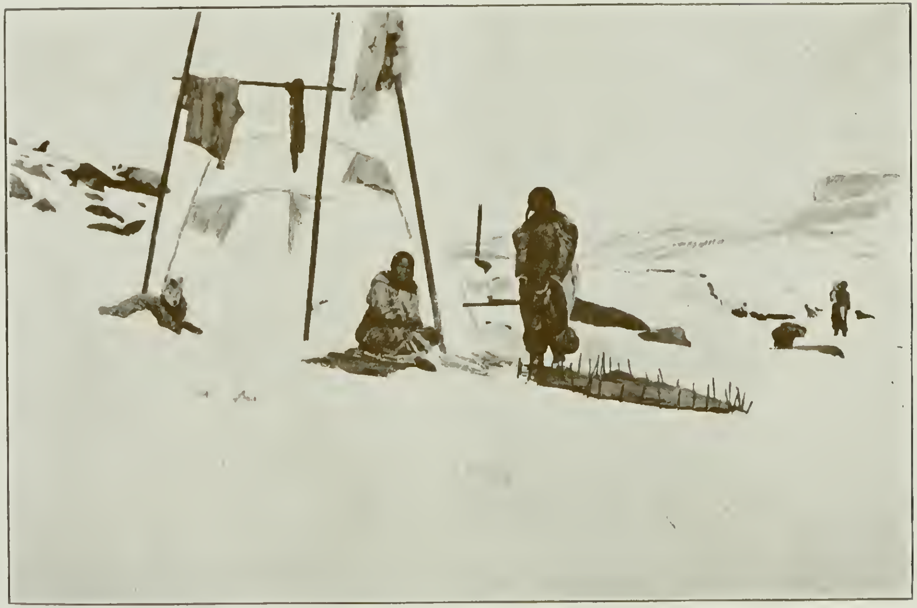
Eskimo Trails.—Opposite to Moffet Bay and continuing south, the rock formation of Brodeur Peninsula changes and there are several mountains near the sound. The rock becomes black and schistose and we were shown samples of copper pyrites pyrhotite, which the Eskimos said came from there. In wintertime the Eskimos travel with dog-sleds across the centre of Brodeur Peninsula, following the valleys, to Port Bowen and Macbean Bay, whence they cross Prince Regent's Inlet to the North Somerset shore for the purpose of hunting walrus and Polar bear. They also pass from Fury Point to Cresswell Bay and crossing North Somerset from Creswell Bay to Peel Sound, run their sleds over some frozen lakes where the land is flat and narrow, for the purpose of hunting musk-ox. The Eskimos also cross to Port Leopold and thence cross Lancaster Strait to Erebus Bay in the winter time after Polar bear.

"Arctic's" trip.—On September 6th and 7th, 1906, the "Arctic" steamed to the end of Admiralty Sound in clear water, going nearly as far as the narrow channel leading to Scheiming, which they named Sassilook, and which means in Eskimo, "shallow water". Soundings there showed 25 fathoms of water. On this trip names were first given to Brodeur Peninsula, Berlinguet Bay, Vanasse Bay, Levasseur Inlet, Moffet Bay, Baillargée Bay, and Strathcona Sound.

Erebus Bay.—Erebus Bay is at the south-west corner of North Devon and is a fine land-locked harbour, open during the months of August and September and formed by Beechey Island with the mainland. The harbour is about two miles wide and about 3 or 4 miles deep, with good anchorage in 13 facthoms of water opposite the Franklin Memorial. The entrance to the harbour is frcm Lanscaster Strait on the south. A permanent memorial in honor of the Franklin Expedition was erected by Captain McClintock, R. N., in 1858, which still stands as a mark of the sorrow and respect of the World for the gallant Franklin and his equally gallant companions. Erebus Bay was the last port in which the Franklin ships, Erebus and Terror spent a winter before being lost in the ice near King William's Land. In 1907 the "Arctic" raised the yatch, Mary, which had been left by the British Franklin Relief ship "North-Star" in 1854 and placed it in a position to be use in case of shipwreck.

The North Star was stationed in Erebus Bay as a base and rescue-ship for the various Relief ships that were sent by the British Admiralty in 1854 and that radiated over Wellington Channel and Barrow Strait in search of the Erebus and Terror. These vessels were the "Assistance" commanded by Captain Sir Edward Belcher: The "Resolute" under Captain Henry Kellett;

1— Cape Riley, North Devon.
2—Rugged Cliffs, north Side of Adams Sound.



Drying seal skins, March 1911.

the "Pioneer" under Lieutenant Sherard Osborn; the "Intrepid" under Captain F. L.McClintock. All of these vessels were lost in the ice and their crews were rescrued by the "North Star" commanded by Captain Pullen at Erebus Bay, and taken back to England without having accomplished the object of their search but they mapped the coast lines of all the islands explored and brought back much valuable scientific information of those regions.

In 1908 the "Arctic" landed four boat-loads of provisions at Erebus Bay and left them in a strong shelter for the use of future expeditions.

Eskimo Tragedy.—Erebus Bay, some 35 years ago, was the scene of an Eskimo tragedy. A large party of Natives from Ponds Inlet assembled to spend the winter, but, presumably, seals and others animals were scarce and the weather was unpropitious, and they began to perish of starvation and disease. As they died, their dead bodies were devoured by the starving survivors. In their desperation they even fell to fighting and killing one another. Only two survivors, a man named Kamming-Eya and a woman named Angestoon, lived to tell the tale, when they were rescued by a Scottish whaler in the following summer, and were taken to Ponds Inlet.

Erebus Bay is 250 miles from Arctic Bay, by way of Cape Crawford and Port Leopold or about the same distance that Arctic Bay is from Ponds Inlet.

Prince Regent Inlet.—As previously remarked, the Eskimos often cross from Arctic Bay by way of Brodeur Peninsula to Prince Regent Inlet; the ice of which is very treacherous owing to the strong currents in that strait, which is full of open-water holes that do not freeze over.

Port Leopold.—On the north-east corner of North Somerset Island is Port Leopold which is open to ships during the months of August and September. Low gives the following description of Port Leopold: "The high limestone cliffs of North Somerset which rise 1000 feet perpendicularly and which are composed of horizontal beds of yellow limestone with the castellated appearence of some gigantic fortress, fall away abruptly into a low point of spingle which partly closes the mouth of the spacious and safe harbour of Port Leopold. The light-coloured limestone, which forms the bottom of the harbour, gives the water a dangerous looking, light tinge, which is quite mislading, as the depth is sufficient for the largest ships. The east and west sides of the harbour are bounded by high cliffs, while at the northern end the land is low, and it is not far across it to the bay on the northeast lying directly west of Cape Clarence".

On August 15th, 1904 the "Neptune" leaving Erebus Bay, steamed across Barrow Strait to Port Leopold, where she anchored. No ice could be seen on that date up Wellington channel, in Barrow Strait or Lancaster Sound.

On August 7th 1907, the "Arctic" entered Port Leopold, altho Barrow Strait was full of ice. The bay was full of narwhales and white wales. The ship filled her water-casks from a little stream that enters the bay from the west. In the evening the ice began to enter the harbour, in large cakes, before a light S. E. wind; they got up steam and tried to escape, but they had to let go a second anchor to keep the ship from drifting. Next morning (august 8th) they let go the steam anchor with a large steel wire. A large piece of ice was across the bow and the ship started to drift, then they let go the two kedge anchors and put the ship full speed ahead on the engine. They seemed to cant the piece of ice. They got two big saws out and began to cut the ice; they were still drifting, but after a while started to go ahead, and in about an hour were clear of the ice. At noon the ice drifted out of the harbour, and they took in the wires and anchors.

Captain Sir J. C. Ross with the British ship "Enterprise" wintered in Port Leopold in 1848-49 when in search of Franklin.

Batty Bay.—Fifty miles south of Port Leopold in the North Somerset east coast is Batty Bay, where William Kennedy, Master of the "Prince Albert," belonging to Lady Franklin, wintered in 1851-52. Kennedy explored Bellot Strait and the coasts of Prince of Wales Island. Batty Bay used to be a favorite resort of the Scottish Whalers, where they killed large numbers of white whales which abounds in its waters.

The white whale.—The white whale (Beluda catadon) a white porpoise, the marsouin of the St-Lawrence River, is common to all the Arctic coasts, and remains through out the year. It usually travelled in large schools, frequenting the bays and mouths of the rivers. In the north large numbers have been taken by the whalers along the coasts of North Somerset, both in Prince Regent inlet and Barrow Strait. It is plentiful in the rivers at the heads of Cumberland Gulf and Frobisher Bay. Many are killed annually by the natives of the south shore of Hudson Strait. The Eskimos depend upon the white whale for part of their food and lamp oil. The meat is coarse and dark, being, like that of seals, highly charged with blood and having a fishy flavor. The boiled skin is a native dainty, being soft and gelatinous. The blubber and skin are valuable, each white whale being worth about $25.00

1 Admiralty Inlet, West of Arctic Bay.
2 Ponds Inlet Coast.
3 Ice pressure Baffin Island Coast.

Cape Rotunda, Adam Sound, 1910.

Government depots.—The Canadian Government has established depots of provisions at Ponds Inlet, Port Leopold, Erebus Bay and Winter harbour (Melville Island).

Parry and Ross.—Sir W. E. Parry made his forth and final attempt to find the North-west passage by way of Prince Regent inlet. He wintered in 1824-25 at Port Bower, Brodeur Peninsula and the next summer lost one of his ships, the "Fury" which was wrecked in a gale on Fury Point on the coast of North Somerset. The Commander of the "Fury" was Captain Hoppner Parry with great forethought, caused all the provisions to be landed from the wreck and safely housed on Fury Beach, where they were subsequently found by Sir John Ross in 1832, who was also trying to find a North-west passage and were the means of rescuing Ross' crew from starvation. Ross had been compelled to abandon his ship the "Victory", on the west side of Prince Regent inlet, nearly opposite Fury and Hecla Strait. Ross' party spent the winter 1832-33 at Fury beach, and escaping from the ice. in boats, were picked up by H. M. S. "Isabella" in Navy Board Inlet. The remains of the wreck of the "Fury" and many old beef tins can still be seen at "Fury" beach.

Two Eskimos with their wives, belonging to Arctic Bay, perished of starvation about 16 years ago when hunting seal and Polar bear in winter at Fury Point.

In August 1910 I accompanied the Canadian Government ship the "Arctic" to Melville Sound in an endeavour to make the north-west passage. We were troubled with heavy ice-floes all the way from Lancaster Sound to 80 miles west of Melville Island, when, we turned back, and, after spending a few hours at Melville Island, where I shot 9 musk-oxen, we steamed back through heavy ice-floes through Barrow Strait and down Admiralty Sound to Arctic Bay where we spent the winter.

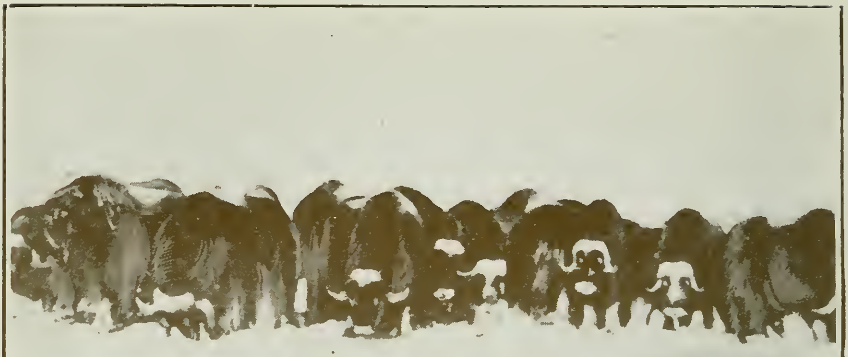
Polar Bear Hunt.—While wintering at Arctic Bay, I occupied a party of Eskimos, in the months of March and April 1911, on a hunting expedition round Cape Crawford and along the north shore of Brodeur Peninsula as far as Cape York. The natives were Izzikakto, his two young sons, Enooara, and Tom Lasso with two sleds and dog teams. We were away about six weeks. On the 11th of March as we were travelling over some very rough ice about 8 miles north-east of Cape Crawford in search of Polar Bear and seal, we came across the largest Polar bear that the Eskimos said they had ever seen. It was an old male which measured over eleven feet in length from nose to tail, and when standing on all fours, measured 4′ 6″ high at the shoulder. It had an enormous head, armed with long yellow fangs, which were much worn, and its paws, full of very long sharp claws, measured over 13 inches in length and breath. The great brute weighed about 1800 ponnds, and, when skinned it required two men to lift the heavy pelt on to the sled.

On that day there was a strong cold north wind blowing, accompanied by snow and there was a good deal of fog and there were many bear tracks in the snow. I was hunting about for seal, when during a momentary clearing of sky, I saw Mr Bruin, crouching on his stomach, near a seal hole, about half a mile away. Calling to the Eskimos, I pointed to the bear, and they immediately loosed the dogs, 27 in number, from the sleds, but keeping them all together by the traces. The dogs had not yet seen or scented the bear. We led the dogs cautiously behind an iceberg to leeward of the bear, and about 600 yards away from where he was crouching, nose to the wind, on the ice. As the wind was blowing in our direction the bears had not seen or scented us. The ice was newly formed and only about eight inches thick. Leaving Tom Lasso and the two boys with the dogs behind the berg. Enooara, Izzikakto and I approached the bear, from behind, over the snow covered ice. When we had advanced about a hundred yards, the two Eskimos began to run towards the bear as they wished to secure the skin before I could shoot and claim it. I ran after them, and when within 300 yards dropped on one knee and fired, the shot passing through his hind leg and body. The bear wheeled round in a flesh emitting a terrific roar of pain and rage. I quickly sent in another shot which took him in the left shoulder about 3 inches above the heart. The Eskimos at the same time fired four shots, only one of which took effect, striking the bear in the body. They were rattled at my quick firing and the range was still rather long for them, as the Eskimos seldom fire quickly. They approach as near as possible to their quarry and take long deliberate aim as they have to economise their cartridges. At my second shot, the bear fell down with the blood pouring from its body on to the ice. But he was up in an instant, and was immediately surrounded by the dogs that, hearing the firing, had broken away from Tom Lasso and the two boys and had rushed in a body upon the wounded bear, which they surrounded, snapping and barking like a pack of infuriated wolves. The bear, roaring with rage and fury, seized the largest and best of our dogs in his teeth, crunched all the bones of his body and with one jerk of his enormous head, hurled the dog 20 yards from him where it remained stone dead. The bear ripped two more dogs with side blows from his powerful claws and they died soon after. The Eskimos and I advanced to within 50 yards of the melee, when they called to me not to approach any closer. We were waiting for an opportunity to get another shot at the bear without killing or wounding the dogs which were leaping and snarling all round the wounded animal. I then dropped my rifle and with my 455 Colt Revolver in hand walked to within 20 yards of the bear, which appeared to be too fully occupied fighting the dogs to be aware of my presence. The Eskimos shouted to me to stop or the bear would catch me. At this moment the bear suddenly wheeled round and saw me, but made another wheel in the direction of the dogs, slashing at them with a scythe-like sweep of his forepaw. Thinking that he had decided to pay no attention to me, I approached a few steps nearer; when suddenly he rounded on me like a flash, and with a blood-curding roar that came from the depths of his stomach, wheeling on his hind lengs, made a quick whirling cat-like bound in my direction. The agility, strength and quickness of the large brute was amazing. I mage a quick snap-shot with the revolver at his enormous white head, when he was about 15 feet away, and the bullet struck him in the centre of the forehead, piercing the brain and lodging in his throat. He had just commenced a second spring in my direction, when my bullet caught him, and he collapsed on his side, but the momentum carried his great bulk along the slippery ice and his head struck my left foot. Fortunately he was dead, with blood gushing from his mouth and the death rattle in his throat, as the air left his lungs. The brute was very fat and old; his body being covered with a thick coating of blubber and his tusks were long, yellow and much broken. When cut up, the carcase furnished enough meat to load the two sleds to their full capacity, and there still remained over enough meat and bones to give the two dozen dogs a full meal.

Another bear-hunt.—One day in September 1910, when the "Arctic" was jammed in the ice-floes of Melville Island, my watch was engaged in filling the watercasks by pumping fresh water from a small pond on the surface of the ice-pan near the stern of the vessel. Seeing the watchman running on deck with a rifle in hands, I looked over the ice and saw a bear climbing over the rough, piled up ice, towards the bow of the ship. I ran on board and got my rifle. When the bear was about 300 yards away, he stopped for a moment and raised his head high in air, as is their custom to sniff the air, when I fired and hit him in the breast. The bear fell and disappear behind the ice. Thinking he was dead, Willlam Morin and I ran over the ice towards where the bear had fallen. Morin was a little ahead of me and unarmed. He came suddenly on the bear which was bathing the blood from his wound by rolling in a shallow pool on the ice behind some ice-hummochs. When he saw us, the bear, which was not over seven or eight yards away, gave a deep roar and came straight for us with his lips drawn back and fangs exposed, growling furiously. Mr. Morin drew back quickly and said "For God's Sake, Fred. don't miss him, or its all up with us". I fired quickly and hit him in the left shoulder, which I broke. As the bear fell I gave him another shot in the temple which finished him.

The Polar Bear.—The polar bear is found everywhere in the northern waters that remain open to any extent during the summer, and upon the ice in the same region during winter and spring months. Wherever seal and walrus are plentiful, Polar bears will be found. They are numerous in Jones Sound, Smith Sound Lancaster Sound, Wellington Channel, Barrow and Melville Straits, Peel Sound, Prince Regent Inlet, along the east coast of Baffin Land in Fox Channel, on the West coast of Baffin Land and on the South shore of Hudson Strait. They even reach the Labrador coast and have been killed on Belle Isle. They live on seal, walrus and lemming. They hunt the seal and walrus along the holes and cracks in the ice-floes, where they will crouch for hours on the leeward side of a seal-hole, waiting for the seal to come up and blow. The moment the seal's head appears above the water, the bear crushes the thin coating of ice covering the hole, and seizes the head of the seal in his powerful jaws, enlarging the hole in the ice with its powerful claws. It then hawls the seal bodily on the ice and often devours it at a single meal. The bear then curls up on the ice and goes to sleep. A Polar bear will travel along the edge of the shore ice about 30 or 40 miles a day in search of seal. It swims like a fish in the sea, spending hours in the icy waters, often going to sleep as it floats on the surface. A bear will swim from one ice-pan on iceberg to another upon which it clambers to rest and to watch for seal. The Eskimos say that the bear, when swimming will dive and catch a seal or young walrus under water and drag it on to the ice. Polar bears unless very hungry or surprised and attacked will seldom attack a man, but the males when hungry or wounded are very savage and dangerous. The female when accompanied by their cubs, are also savage. Bears have a very keen sense of smell, and have been known to come alongside ships beset in the Arctic ice, in search of garbage, when many of them have been shot from on deck. They are also shot from the decks of vessels when swimming through the ice-pans. A bear will run away from a noise, unless very hungry, when it will attack. Nine bears, females with their cubs, were killed by the Eskimos near Button Point in April 1913, where they had camped in the glaciers on the east coast of Bylot island, and where they had scooped great hollows in the deep snow for a shelter. They would climb the hills in the vicinity and after their long winter's sejourn came out with their new-born cubs to loōk around for a few days, before going out on the ice-floes in search of seal. These bears were quite fat. Osborn mentions that both male and female bears some of the latter followed by cubs were seen on the ice at all seasons of the year north of Wellington Channel. Early

First Polar Bear killed by Alfred Tremblay.



1— Musk-ox in Melleville Island.
2— Second Polar Bear killed by Alfred Tremblay.
Return Reindeer hunting trip.

in June he observed a female bear over-turning blocks of sandstone on the east shore of Bathurst island that her cubs might secure lemmings underneath; and he saw her suckle her young sitting on her haunches and lowering her breasts that cubs might reach them from a standing position. No traces of bear were met with by McClintock along the northern shores of Melville or Prince Patrick island, but two were seen by Mecham on the south shore of the latter. Three males were killed by sled parties from the Arctic, south of Dundas Peninsula during the second week in April 1909, and on the 27th a female and cub destroyed the outfit and camp of second officer Morin near Cape John Russell, Bank's Island. On this occasion the bears visited their igloo and sledge, tore up their sleeping bags and ate up much of their provisions. Mr. Morin and his companions had to travel across McClure Strait to Providence Cape, on Melville Island, over 65 miles of the roughest ice imaginable, before they could get any more provisions or shelter.

The Eskimos use cunning and show great nerve when hunting bears and even boys of fourteen approach and shoot them from a distance of ten yards. The Eskimos will dress themselves in sealskins and lie in one spot, allowing the bears to approach them unsuspicious of danger and when bruin is close enough to make the aim perfectly sure the Eskimo shoots and invariably lays the animal out within a few feet of himself, either dead or so nearly so that there is not much difficulty in dispatching him. When on the march, the Eskimo, on catching sight of a bear, will loosen his dogs which immediately chase and surround the animal. When engaged with the dogs, the Eskimo approaches close to the infuriated and fighting animal or either shoots it or keeps launching his harpoon, to which a seal line is attached, into the soft flanks of the bear, until it succumbs through loss of blood. But it is a dangerous pursuit at all times, and on one occasion an Eskimo of Ponds Inlet when on a distant bear hunt with his wife and two small children, was caught and killed by a bear. The two children died of starvation and the mother lived on their dead bodies until found by some more Eskimos who were hunting in the same region.

An adult male bear will measure 12 feet from nose to tail and will stand 4′ 6″ at the shoulder and weight about 1800 pounds. The skin of an adult Polar bear is worth from $50.00 to $75.00 according to size. The bears apparently bring forth their young in March and April, and the cub remains with its mother until it is two years old, when it is able to forage for itself.

Lavoie's Expedition.—During the winter of 1910-11, Mr. Lavoie the Government surveyor attached to the "Arctic" expedition crossed Brodeur Peninsula from Admiralty Sound, accompanied by Coonoo and Peewiktoo and their wives, and surveyed the west coast of that peninsula as far as Aggo. He returned from Aggo crossing the lands and frozen lakes to Scheming and then crossing the land and frozen ponds between Vanasse Bay and Moffet Bay, reached Arctic Bay.

Moffet Bay.—Moffet Bay is a fine sound where the Eskimos resort in summer time to hunt caribou. Tom Lasso killed 73 caribous there in one summer. There are also three fine salmon rivers flowing from small lakes into the sound and the Eskimos say that there is fine anchorage for a ship. Admiralty Sound is navigable and comparatively free of ice from August 15th to the end of September. At the entrance of Moffet Bay there is a seal hole near the islands, which does not freeze over in winter, owing to the strong current.

Navigation of Lancaster Sound.—On August 3rd 1907, the "Arctic" steamed through Lancaster Sound in thick fog as far as Port Leopold, having to make her way through a great number of patches of ice. On August 5th she steamed down Prince Regent Strait as far as Cape Kater, where the ice-pack was met with; but no ice was visible along the eastern shore of Prince Regent Strait. On August the 9th the "Arctic" tried to steam across Lancaster Strait to Erebus Bay, but was prevented by meeting an immense field of ice in long 87° 43′ W. while Lancaster Strait to the east was all clear water.

On August 13th and 14th, 1904, the "Neptune" steamed west through Lancaster Strait to Erebus Bay and encountered hardly any ice. From Beechey Island no ice could be seen to the westward or northward in Wellington Channel and Barrow Strait. The "Neptune" then steamed across Lancaster Strait to Port Leopold through gale and fog on August 15th, which was ice-free and entered that harbour without difficulty. The "Neptune" returned to Ponds Inlet in a gale of wind and thick fog on August 17th without encountering ice in Lancaster Strait, although the north shore of Bylot island was fringed by a wide belt of heavy field ice. On August 18th to 21st, Eclipse Sound as far as Salmon River was free of ice, although the western end of the sound was full of ice.

Lancaster Sound including "Barrow Strait" from Baffin Bay to Mellville Bay is about 450 miles long with an average width of 40 miles and is the only northwest passage for deep draught vessels. Captain Bernier who spent the winter 1908-9, at Melville Island, with the Canadian Ship "Arctic", found that the climate, as compared with the records of previous expeditions, was gradually becoming milder and ventured the prediction that navigation in Lancaster Sound, one hundred years from now, would be as easy as it is in Hudson Strait.

Polar Bear killed by Capt. Bernier.

Musk-ox heads.

The best time to enter Lancaster Sound, as far as Admiralty Sound, Port Leopold and Erebus Bay, is after August 12th, returning by the end of September. The worst place for congestion of ice-floes in Lancaster Sound, is Barrow Strait, between Griffiths and Lowthers island on the north, and Russell Island on the south. Here the narrowest passage, being only 25 miles wide and the heavy ice-floes from Wellington Channel and Macdougall Strait on the north, Melville Bay on the west, and Peel Sound and Prince Regent Inlet on the south, pour into Barrow Strait and become jammed there in the vicinity of Griffiths island by the strong tide and heavy gales.

The best time to pass west of Erebus Bay is from August 24th to September 1st, keeping close along the shores of Cornwallis and Bathurst islands.

The Western Island.—The island of the North Somerset, Prince of Wales, Brodeur Peninsula, Russell, Lowther, Griffiths, Cornwallis, King William, Victoria Land and the South Western corner of North Devon consist of barren limestone rock, which is devoid of vegetation and therefore of animal life, although their shores abound in seal, walrus, narwhal, white whales and Polar bear.

The western shore of North Somerset and the eastern side of Prince of Wales Island, on each side of Peel Sound, are however composed of Archaen rocks and sandstone which provide vegetation for herds of musk-oxen and caribou which roam along the shores. Salmon are also said to exist in the rivers of North Somerset.

Original route of Musk-ox, Caribou and Eskimos.—The musk-ox and the caribou must originally have journeyed up Boothia and Melville Peninsulas from the mainland of Canada, crossing Hecla and Fury Strait into Baffin Land and crossing Bellot Strait to the islands of North Somerset and Prince of Wales. From Peel Sound they crossed Lancaster Strait to North Devon and up Wellington Channel to Grinnell Land. Another stream crossed Coronation Gulf to Prince Albert Land and Banks Island. Then across McClure strait to the fertile plains, rich with a profusion of Arctic grasses and vegetation, of Melville island and Prince Patrick island. From there they wandered over to Byam Martin and Bathurst Island and to the rich pastures of the broad, coast lowlands of the Sverdrup island. These two streams then converged and pushed along the fertile shores of the west coast of Ellesmere land as far as Grant and Grinnell lands, and perchaps even to Crocker and Bradley lands, further north. They had only to cross the narrow neck of land that separates Bay Fiord and Flagler Bay in Ellesmere land to reach Smith Sound, whence it was only a short 30 miles across to Greenland where musk-ox and caribou are found in the vicinity of Etah.

Eskimo route.—The Eskimos who have always lived by the chase must have followed the same route, where the hunting was good, and this would account for their presence in North-Western Greenland. The natives from Etah regularly cross Smith Sound every summer, and journey overland to Bay Fiord where they slaughter numbers of musk-ox and caribou that are found on the western shore of Ellesmere Land, where is a wide margin of soft mesozoic rock which forms low plains extending from the seashore several miles inland to the base of the high cliffs of the older rocks. These plains are covered with Arctic vegetation. Musk-oxen, barren-ground caribou and arctic hares are found there in large numbers, along with geese and other aquatic birds. Along the west side of North Devon there is lower land with good growth of arctic plants on which large number of musk-oxen some caribous and arctic hares feed. Bathurst island, Byam Martin Island, and Melville Islands, which consist of carboniferous sandstones, are covered with a rich growth of vegetation where thousands of musk-oxen, caribous and arctic hares roam cententedly. Banks Land, also formed of carboniferous sandstone, feeds large bands of musk-oxen, caribous and arctic hares in the rich soil of the deep valleys. The Sverdrup Islands or Axel Heiberg, Amund Ringes, Ellef Ringes, King Christian and North Cornwall consist of high lands composed of bedded rocks and eruptives in the interior with low wide foreshores, where game is plentiful. On the barren limestone islands there is neither vegetation nor animals.

Sverdrup found the remains of Eskimos encampments everywhere along the west coast of Ellesmere and not knowing with what ease the natives of Ponds Inlet and Admiralty Sound crossed Lancaster Strait to Erebus Bay, speculated where they had come from. Remains of old Eskimo encampments have also been found in Byam Martin Island, Bathurst Island, and Melville Island and round the shores of Lidden Gulf, Melville island, which showed that they followed the musk-ox and caribou everywhere. With the exception of Etah and Cape York, on the Greenland side of Smith Sound, there are no Eskimos now living north of Lancaster Sound. The Eskimos apparently were formerly more numerous than they are at present and the hundreds of old graves at Killalookan on Eclipse Sound and at other places would seem to show that they had been swept away in large numbers by epidemics of desease.

The Musk-ox.—The musk-ox (ovibos) was originally found all over the northern plains of Asia and Europe, as well as on the Americain Continent. How it desappeared from there does not seem to be known. It is now only found in the barren lands of Canada from the Mackenzie River to Hudson Bay and in the Arctic Islands of Canada.

The musk-ox is the largest and most characteristic land animal of the Arctic Regions of Canada. They form the darkest objects on the landscape, being distinguished from rocks by the intense black of their shaggy coats. Yet their covering of haire is not entirely black in colour, that on the legs being light grey and a patch on the back just behind the long hair on the mane is almost in light colour. In addition to this long hair which is from one to three feet in length, they possess a thick covering of dark grey wool from six to eight inches in length, which they shed in great bunches in the summer. A more perfect protection against the cold could hardly be conceived. Nor have they anything to fear in their native haunts, the spreading base of the horns in the male, with the greatly thickened frontal bones, render a lead bullet from an ordinary low velocity Rifle in the head inaffective, and must be equally as good a protection against the attack of wolves. Upon being alarmed they immediately form a line facing the approaching danger, and press so closely together that they may be seen stepping on each others' feet. The whizz of a bullet, a well directed stone, or the sound of the human voice will cause them to turn and gallop furiously away; but they usually face about after the leading bull, and again form into line within a quarter of a mile. They run at the rate of about five miles an hour. Musk-oxen are distributed over the northern mainland east of the Coppermine River to the Telzoa and Doobawnt Rivers that run into Chesterfield inlet, all the Arctic Islands except Cornwallis, Baffin and Bylot islands and on Melville Peninsula, and the northern part of Greenland. A perfectly white musk-ox cow with a black calf was seen by Lieutenant Mecham at Cape Smyth, on the north-west of Liddon Gulf, Melville Island. On June 13th 1909, the musk-oxen were seen near Winter Harbour, roaming in numbers over the island after the spring vegetation. Three large bulls were killed and the meat, when skinned and dressed, was very good and tender, although less fat than when killed in the fall. The skins were poor, as the animals were shedding their coats, the wool working out gradually. The musk-oxen were easy to approach and kill often continuing to graze quietly until fired at. They have great vitality and a high-power expanding bullet behind the shoulder, is the best manner to despatch them. The male animals only, when wounded, will make an attempt to escape or attack their foe. Their great vitality and strength enable them to make furious efforts after being shot although severely injured they will keep on their feet and they are far easier secured when in large herds, as they seem to be less fearful when they are in number, and stand their ground. Single oxen or a few in number keep at a distance and attempt to escape. The leader of a herd is always in advance of the others, and when danger from wolves or human beings is sensed or sighted, returns and warns the herd, which stops. The scattered ones are rounded up by the leader, who pushes or horns them into the group. If no danger is apparent the herd follows the leader along their accustomed grazing districts or paths. When a foe appears the herd forms a partial circle with the male animals on the outside and the female and young in the rear. The leader occupies the most dangerous position, and if killed or overcome, another male takes his place. When attacked, the leader makes an occasional short charge and then returns to his post. The herd is always more easily secured by killing the leader and his successors first. The most vital spot to aim at in shooting are the chest or behind the shoulder, but even if hit in those parts, a male musk-ox will run for some distance with several expanding bullets inside him. When assailed by a number of hunters they are apt to stampede, but the rush does not last long, and they will make a stand again until too hard pressed. The meat is very palatable in the fall of the year, but the hide must be taken from the animals shortly after they have been slain, and the insides removed, or the meat becomes tainted and has a disagreable odour. The various expeditions to Melville island always prefered the musk-ox beef to the fresh killed beef of ordinary cattle. On August 9th 1909 a small musk-ox calf was captured near the ship and taken on board, where it was kept and became very tame. In the preceding May another very young musk-ox had been captured near Winter Harbour and was cared for by the men on board the "Arctic" who fed it on concentrated milk and porridge. Both these young musk-ox became very tame and would follow the men about like dogs. One died from swallowing some of the contents of a paint pot which was left on the deck. The other was taken to Quebec and was eventually presented to the Bronx Zoological Gardens of New-York. A full grown musk-ox will weight on the hoof close to 1,000 lbs and, when dressed give 450 lbs meat and bone. The average weight of the dressed carcase, minus head, hide, hoofs, and inside parts is 300 to 350 lbs. The hide in good winter condition is worth about $75.00.

Battle with a Musk-ox.—Lieutenant J. C. Ross gives the following graphic account of an encounter with a wounded musk-ox near Cress Well Bay, North Somerset in may 1830:—"The sight of a fine musk-ox at bay before the three dogs cured our fatigue in an instant and we went off ourselves at full speed to the rescue. Poo-yet-tah, however, kept his lead in front of me and was in the act of discharging his second arrow when I came up. We saw that it struck a rib, since it fell out without even diverting the attention of the animal from the dogs, which continued barking and dodging round it, seizing it by the heels whenever they had an opportunity, or when it turned to escape, and then retreating as it faced them. In the meantime the animal was trembling with rage, and labouring to reach its active assaillants

Seal Hunting Apparatus.

Base of Cross Arctic Bay.

but was unable to touch them, experienced as they were in the service. Seeing that my native companion's weapon were of little value in this warfare, or that the victory would not at least have been gained under many hours; as he continued to shoot without much apparent effect, finding his opportunities to aim with much difficulty, and losing much time, afterwards, in recovering his arrows, I, therefore, fired at the animal with two balls, at the distance of about fifteen yards. They took effect and it fell; but rising again, made a sudden dart at us, standing close together as we were. We avoided the attack by dodging behind a large stone, which was luckily near us, on which, rushing with all its force, it struck its head so violently that it fell to the ground with such a crash that the hard ground around us fairly echoed to the sound. My guide, on this, attempted to stab it with his knife; but failing in this, he sought shelter behind the dogs, which now again came forward to the attack.

"At this time the wounded bull was bleeding so profusely that the long hair on its sides were matted with blood; yet its rage and strength seemed undiminished, as it continued to advance and butt with the same ferocity as before. In the meantime I had reloaded my gun (a muzzle loader) behind the stone, and was advancing for another shot, when the creature rushed towards me as before, to the great alarm of Poo-yet-tah, who called to me to return to the same shelter. But I had time for a cool aim; and it inmediately fell on the discharge of both barrels, but not till it was within five yards of me. The sight of his fallen enemy made my companion scream and dance with joy, and on his coming up, it was dead; one ball having passed through the heart, and the other having shattered to pieces the shoulder joint. Poo-yet-tah was lost in horror and amazement at the effect of the fire-arms, but it was the state of the broken shoulder which most surprised him."

The musk-ox is especially abundant on Melville Island, where countless herds frequent the low ground where grasses and moss flourish. They roam aimlessly about (writes Mr Henneasey of the "Arctic" expedition) in herds of from 3 to 20, but sometime as great a number as forty will band together. Their great coat of hair is very long, sometimes trailing the ground, and frequentely attaining a length of forty inches. The forequarters of this animal are much more powerful than the hinder, but appear much larger than they really are by the presence of the wooly mane with which their shoulders are covered. So appearent is this, that a large bull advancing towards a person, may be mistaken for two animals. Their coat which is at its best from the month of November to the end of April, is made to appear very odd looking in the spring, by the large clumps of wool that hang suspended from the hair and which it is sledding. When enraged or suspicious the musk-ox paws the ground or snow frantically with his forehoofs. They are an animal of great vitality, as they must be to withstand the rigours of the severe winters to which they are exposed

How Arctic Animals live in Winter.—An answer to the query as to how the wild herbivorous animals, like the musk-ox and the reindeer survive the winter in that snow covered land Peary writes: "By a strange paradox, the wild winds that rage in that country help them in their struggle for existence for the wind sweeps the dried grasses and scattered creeping willows bare of snowover great stretches of land, and there the animals can graze."

In the spring of the year the herd generally break up and the animals, especially the bulls, roam about singly, but, as the winter approaches, they again congregate in herds. The foot print of the musk-ox is very difficult to distinguish from that of the barren ground caribou but if the trail be on snow it should be followed until the animal treads upon deeper parts, when it will be found that the impression made by the caribou will rest much nearer the surface than that of the musk-ox. If the imprint be on sand or in soft mud, it may be determined by the greater diameter of the hinder part of the impression in the case of the musk-ox, and by the greater space between the two fore parts of the hoof in the case of the caribou.

These valuable animals, which combine the wool-giving qualities of the sheep with the beef of cattle, could undoubtedly become a most valuable asset to the farmers of Canada. They are easily domesticated and if a stud-farm and muclues herd could be inaugurated at some convenient spot, like Southampton Island, in Hudson Bay, which is a naturel game resort for caribou and birds of all descriptions it would soon grow large enough to stock the Western Prairies with this highly valuable animal. Young ones could be caught by the Eskimos inland of Chesterfield Inlet and in the Arctic Island and conveyed every year to the breeding station. The wool is of the best quality, and knits into the warmest of mitts, socks and neckties.

It seems a pity that an animal, combining so many valuable qualities as the musk-ox, should be allowed to go to waste and extinction, when, with a little expense, trouble and care it might be made the most valuable adjunct of the farm.

CHAPTER V

On January 23rd 1913 Wilson left Arctic Bay in company with Coonoo, with the object of prospecting Strathcona Sound for mineral. Afterwards he was to go to Ponds Inlet and, if possible, return to Aggo with more provisions and then join me in a prospecting tour round Fury and Hecla Strait and Melville Peninsula as the natives had shown us some samples of likely looking quartz from that region.

But Wilson caught cold, through sleeping in a draughty igloo on the way to Ponds Inlet by way of Lancaster Strait and Navy Board inlet. Settling on his chest it developped into inflammation of the lungs which kept him in bed at Salmon River for a couple of months. He took with him a requisition from me to the storekeeper of the expedition, to send me more cartridges for my 280 Ross Rifles and some more provisions, which, in case Wilson could not join me at Aggo, were to be sent to Scheming where I would arrange to have them sent on after me, by an Eskimo, to Igloolik.

Reasons for Expedition.—Foxes being scarce round Arctic Bay, and as the object of our expedition, as agreed upon in Quebec, was to explore the country in all directions for furs and mineral, we decided to go to Scheming, at the head of Admiralty Sound, and thence to Igloolik and Melville Peninsula, and if possible to map the unsurveyed eastern shore-line of Fox Channel.

Hards hips Endured.—On January 29th I started from Arctic Bay with the faithful and cheery Peewiktoo and his staunch little wife, Tootillik; the day was intensly cold. By the time we reached Ponds Inlet on May tenth, three and a half months later, we had covered over 2000 miles of the roughest and coldest travelling imaginable. The temperature throught-out the whole trip varied from 25° and 55° Fahr. below zero, and storms and blizzards were of frequent occurence. After reaching Scheming we had no provisions or fuel and had to depend on our rifles to provide food for men and dogs. We often ate nothing for 48 hours and what we ate was raw, frozen and generally rotten, walrus salmon or caribou meat. The dogs frequently had nothing to eat for 4 or 5 days at a time. The ice in many places was of the roughest description, and, on land the snow was so deep and rotten in places as to be almost impassable. The caribou were wild and difficult to approach on the land, and the seal in the open water holes would when the wind was strong, bob up their heads only for a moment for air and disappear again, which made the shooting of either in the intensely cold wind a matter of great uncertainly and difficulty. The knowledge that our cartridges were so few and that our very lives depended upon the accuracy of every shot at a disappearing seal's head or a flying caribou generally from 500 to 800 yards distant, added to our anxiety. I had depended of course upon provisions and cartridges being sent after me to Scheming or Igloolik.

Equipment.—We commenced our journey with half a barrel of biscuits, 20 lbs flour, 15 lbs pork, 4 lbs tea, 15 lbs suggar, 1 gallon molasses, 10 lbs cooked beans (which were almost uneatable) and two large seals (one which weighed about 300 lbs), with which to feed the dogs and provide blubber for our Eskimo stove, consisting of a small open tin pan with a wick of moss and vegetable cotton spread along the rim. This stove was all that we had with which to light and warm our igloo, and, as may be imagined we suffered greatly at night from the intense cold in the draughty igloos of snow that we constructed at the end of every day's march.

No alternative.—I had no alternative of starting later or of waiting at Arctic Bay until I received more provisions and cartridges from Ponds Inlet as I had to cover some 2000 miles and more over unexplored territory and then return overland before the end of May when the land would be swept bare of snow and the sleds would be unable to travel.

Clothing.—For clothing I had three bags of clothes that I had brought with me from Quebec and a kulitang or Eskimo cloak and hood made of caribou skins, a pair of caribou knee breeches and seal boots. I discarded the skin-clothing most of the time as the exertion of walking and running after the sled through the heavy snow, and of constantly pulling and righting the sled, caused me to perspire too freely and then I would suffer from a subsequent chill from the biting winds and the very low temperatures.

Arms, etc.—For arms I had my trusty 280 High Velocity Ross Sporting Rifle, which, after much testing in all kinds of winds, weather and temperatures, I proved to be the best rifle in the world for all kinds of game. The 280 Ross has the flattest trajectory, the best lock system and the greatests hocking power of any rifle I know of, and I have used them all. Another quality in its favor lies in the fact that there is no preliminery adjustment of sights as the same sight does for 100 or 500 yards, which is a most important factor when shooting at flying game at an unknown range. I had 200 copper-tube expanding bullets for this rifle. I

Arctic Caleche, June 23rd 1911.

Eskimos party on Admiralty Inlet, October 1910.

also had a Colt 45 Automatic Pistol with the case serving as a shoulder-butt, and this too, is the best secondary arm in the Arctic or anywhere else. With this Colt I often shot seal at 100 yard range when only their noses showed 5 inches above the rippling water and I had on other Expeditions shot Polar bear and small game with the same arm. I started with only 100 cartridges for this Pistol as I had previously lost 200 Pistol cartridges which dropped off the sled in the rough ice when travelling from Ponds Inlet.—I also carried a small hatchet, 3 skinning knives, a snow knife and a saw for cutting snow blocks for the igloo. Peewiktoo had an old military Mauser, 43 calibre, with 50 cartridges, a snow knife, a saw and an old broken hatchet for chopping tusks out of walrus heads, etc. We each carried a harpoon with which to catch seal.

For sleeping bag I had a caribou-skin bag (hair inside) which fitted inside my seal-skin bag and an old blanket, As the seal-bag was continously wet through and frozen by the snow and frost, I had great difficulty in getting into it, having first to thaw it out by the warmth of my body and then push into it, feet foremost, by instalments. I suffered in consequence a great deal from the cold.

We also carried 114 Victor No 2 Fox Traps which added considerably to the weight of the load.

Small dog power.—Our sled was an old one belonging to Peewiktoo which had already seen much rough service, and which was constantly needing repairs. We had eight dogs, four of which were good and the others were small pulling power with the result that Peewiktoo and I, for many days, had to harness ourselves with the dogs to the heavy sled, and my body and collar bones bear witness to this day to the rough harness work and heavy hauling we had to do.

Drop baggage.—The first day, on account of the load being too heavy for the dogs, two of which were too old and two were too young to be of much use, when crossing some rough ice in the Arctic Bay, we threw off half the load and camped on the south shore of Adam's Sound, where we built an igloo and spent the night.

January 30th Peewiktoo and I took the sled back for the seal and baggage that we had left on the ice in Arctic Bay, leaving Tootillik to mind the igloo and stores in our absence. The weather was intensely cold and the sun was not yet visible.

The need of Eskimos.—January 31st, the next day, as I had noticed many wolves' tracks in the snow, I decided to take the whole load with us, and harnessing myself with the dog pulled the sled all day. Peewiktoo drove the dogs and helped to pull the sled, while his poor little wife walked during the whole day, which is an accustomed thing for the Eskimos to do. Without the Eskimos, travelling in the Arctic would be almost an impossility for the white men. The suffering and hardship would be too great, while the Eskimo is rarely at a loss, and long custom has taught him where to look for seal and other animals with which to feed himself and his dogs and how to protect himself from the elements. It is surprising how the natives find their way without compasses in these barren lands and among the vast labyrinth of sounds, island and mountain ranges. They place stones in different positions at several places and use these as marks; every native has his own marks which are recognized by the others who can tell there-from who has passed along the route, although they can not tell the direction of the route followed from the stones. They calculate the distance from one place to another by the number of sleeps (skinnikpoo) or days, every rest or sleep counting for one day a skinnikpoo generally means from 20 to 30 miles per day, the distance for each day varying with the number of dogs, the weight of the loads on the sledge and the roughness or smoothness of the road travelled, all of which effect the number of miles travelled in a day.

First view of the Sun.—We marched and hauled the sled all day without stopping to rest, and camped on the ice near the shore. As the twilight in day time only lasted for a few hours, our marches were short during the next week or so. On this day we saw for the first time the rim of the sun peep above the southern horizon and it was a cheering sight after nearly three months of dismal obscurity. The weather was intensely cold, but as there was little wind it did not incommode us greatly. We suffered however from the cold during the night, as a bitterly cold wind sprang up and nearly blew the igloo down, and the cold draughts nearly froze us in our sleeping bags, and we could not put much blubber on the stove as our two seals had to last us until we reached Scheming. For supper we ate some of the infamous boiled beans that needed a hunger like that of a famished wolf to make us face them.

Bad weather and intense cold. — February first. — Taking our place once more among the dogs we resumed our march in spite of a protest from the Eskimos, who feared to brave the bitter north wind, which nearly bit us in two. Fortunately the wind blew on our backs and not in our faces: but when we came to look for a place to build an igloo that evening on the bleak expause of the sound, our sufferings became intense. The perspiration, when we ceased to walk, froze on our bodies and I almost decided that it would be better to march all night in order to keep warm. We spent a schivering hour looking for snow for an igloo, and when we found it I froze my hands and wrists handling the snow blocks in the biter wind. Whenever I faced the wind to lift the snow blocks into place my nose and cheeks would freeze and I was often compelléd to stop and rub them with snow in order to restored the circulation. At last the unwelcome task was finished, and we plunged into our gloomy and draughty snow hut and into our frozen sleeping bags after a hasty meal of the noxious beans, and tried in vain, to forget our misery in sleep. My nose and cheeks were skinned from constant rubbing with frozen snow and my shoulders ached and my hands were cut and bleeding from pulling at the seal-cord attached to the sledge.

Rock formation. — The cold was too intense to permit of sleep so we shivered all night as the igloo was pitched on the unprotected surface of the sound about 300 feet from the eastern shore which appeared to me to consist of a dark rock resembling diabase and which might pay to prospect for mineral.

February 2d.—The wind was not so strong next morning, and we resumed our march, pulling the sled as before. We made good progress and camped that evening on the sound, close to the land. The wind increased in strength at night and we suffered again intensely when building the igloo and during the night. Still the same nauseating beans to haunt our slumbers.

Repairs.—February third.—We remained at this camp the next day and night as we had to repair the sled, as the lashings had become loosened through pounding over the rough ice under the weight of the heavy frozen seal. We also repaired the dog harness which was continually being cut by the sharp ice.

Near Moffet Bay— February fourth. — A very cold day with less wind. We started early and toiled in the harness all day and were all tired out when we reached our camping place. We camped close to a small island in the middle of the sound, near the entrance to Moffet Bay. The rock on this island appeared promising as it consisted of diabase or diorite, crossed by numerous small veins of quartz, calcite an mica schist.

Thirst and illness.—During the day I suffered intensely from a raging thirst, which was aggravated by the exertion of pulling the sled. I tried to appease it by drinking snow along the route and when we camped at night drank too freely of cold water made from melted snow. The horrible beans being finished, we dined ravenously on old buck seal, half cooked, which had a disgusting flavour and smelt abominably. Even the dogs, hungry as they were, seemed to balk at this tough old seal. The result was I felt as if there were a lump of ice on my chest and stomach, and I commenced to get cold and to shiver all over. I crept into my frozen sleeping bag but, could not sleep on account of the pain and the cold, as the igloo was like an ice-house.

Very sick, indeed.—February fifth.—In the morning I was so ill, that I had great difficulty in getting out of my sleeping-bag, so weak had I become. Peewiktoo and Tootillik became alarmed and wished me to leave the things and to hurry back to Wilson at Arctic Bay, as if I was going to die, they feared that they would be blamed. I refused and said that I would, now that we had started, push on to Igloolik, even if I died on the road.

They harnessed the dogs and loaded the sled and we resumed our march southward. I tried on several occasions to help pull the sled, but kept falling down in the snow, so I had to abandon the attempt and staggered along feebly behind the sled, often falling from weakness. When I picked myself up I could see at least two sleds ahead of me all the time. Once when I ran up to the sled to try and help the dogs, I fell and struck the end of the sled with my shoulder. I think that if I had struck it with my head, I should have given up. Peewiktoo looking back and seeing me fall said: "You plenty sick, better go back."

Near death.—At last I could go no further, as the pain was catching me all round the base of the liver, and it felt as if it was creeping close to the heart. I thought that it was all up with me and that any moment I should drop dead. Peewiktoo and his wife began to cry, but I told them not to be afraid. So they made an igloo and I crept into it, thinking to die. I tried to write a letter exonerating them from any blame, and told to them to take my body if I died, to Ponds Inlet, where no arm would come to them, and I told Peewiktoo and Tootillik that they could have my rifle and clothes and to give my revolver to Etotah, his brother. Peewiktoo said: "You no fraid to die? Eskimo plenty fraid to die". I told him that: "White men are not afraid of death".

My fingers were too cold and cramped to write and one moment I would burst into a profuse perspiration and the next would be shivering, as cold as ice. Peewiktoo sat with his head in his hands, the picture of woe, and Tootillik began to cry. I could neither eat nor drink anything all day and to this and the efforts that I had made in walking after the sled, I attribute the fact of my not succombing. Had I stayed in my sleeping-bag at the last igloo I am confident that I should not have left it alive.

I had to sit through that long dreary day, cold as ice in the igloo, with my right shoulder propped against a bag. Whenever I tried to rest on my left side, the pain would catch me round the heart, and I could not breathe untill I changed position. Several times when Peewiktoo spoke to me I could not answer and I many times felt that the next moment would be my last and that I should never leave the igloo alive. I told Peewiktoo, who wanted to sit up with me, to go to bed and sleep. I wanted to keep up their courage and told them I would soon be well again.

But they saw the alteration in my face and became very alarmed, Tootillik crying all the time. Had I swooned or lost consciousness but for a moment, and have fallen on my left side, my heart would have stopped beating at once. The pain seemed to cut my very inside in two. I never hope to go through another such day and night in this life, as death would have been a relief.

The camp was pitched less than two miles from the last one, as I could not walk any further. The cold continued intense, being 45° below zero. My hands, face and feet seemed frozen all the time as my blood was thin and chiled from fasting

February sixth.—Feeling no better in the morning, I decided that if I had to die, it might as well be here as to struggle on for another mile or two and then die on the ice, as so many of Franklin's men had done before me. In the evening I began to feel somewhat better, the pain was less severe and I could rest easier. I neither ate nor drank anything that day, going two days and nights without food and drink.

Convalescent.—February seventh.—Feeling somewhat better I ate a little biscuit and we started on our march again, as our seal meat was getting exhausted and we had little to give the dogs. We must either reach Scheming or all perish of starvation I was so weak that I could hardly wabble along behind the sled. Had I sat on the sled the dogs could not have pulled the load. We managed to travel some five or six miles and the walking improved my condition, as it restored the circulation of my blood. Two miles were over very rough ice, where the pans of young ice had met old Arctic pans and the edges had crumpled up into cakes There was an open water-hole right at the point that had just frozen over, as the rapid tide there had kept the ice from forming. I remarked the track of a medium-sized Polar bear on the snow. We camped on the sound and I was able to make out the character of the rock on the peninsula west of Moffet Bay, which looked favorable for prospecting and consisted of a clear brownish rock that seemed to contain magnetics.

The weather was terribly cold and the operation of building the igloo was a most painful one, handling the heavy snowblocks in the bitter wind.

Snow igloos.—When travelling in the wintertime, the Eskimos build a small snow-house or igloo every night with blocks cut from a convenient snowbank. These small houses, built only for the night, seldom exceed nine or ten feet in diameter, and it is only when a considerable stay is expected that larger houses are built.

The Eskimo first tests the snow of the neighbouring banks by probing with his long snow-knife, often a 12 inch butcher knife, and when he finds a bank formed from the drift of a single storm, he cuts an oblong hole about five feet long, 2 or 3 feet wide, and about 20 inches deep, with a clean face. He next cut blocks from this face, these blocks are about 5 or 6 inches thick and 20 inches deep. When each block is cut out it is eased away with the knife and with blows from the toe applied underneath, and gently pried from its position in the bank, so as not to break it. About seventy or 80 of these blocks will form a small igloo. One man usually cuts the blocks while another builds the house. A circle the size of the intended house is traced on the surface of the snow and the first circle of blocks are arranged round, all touching. When this is completed the first few blocks are cut down diagonally, so that the next layer, placed on top will take a spiral form and the layers, as they are superimposed, gradually take a spiral form, leaning inwards, until the dome is reached and closed by an irregular shapped key-block, with a hole cut in it, for the ventilation and to allow the smoke from the seal-stove to escape. The spiral manner of building is superior to a succession of lessening circles, as each block is so cut by the man standing inside, as to be kept in place by the block placed immediately before it, and thus only one man is needed at the work of building, whereas if the circular method was used, the different blocks of the circle would required to be held in place until the circle was complete. The finished house is a snow-dome, in the form of an inverted cup, about 6 feet high in the center with sloping walls and the arc flattened at the summit. When all the blocks are in place, the cracks between them are chinked with loose snow, generally by the women, who also help to carry the blocks. A door is now cut in the wal about thirty inches high and 18 inches wide Opposite the door a raised platform, about 18 inches higher than the floor is made inside the igloo, of snow blocks upon which sealskin and caribou skins with the hair left on are laid to form the sleeping place, where on the sleeping bags made of caribou skin are laid with the feet against the wall and head towards the door. A low snow block porch or tunnel is built out from the door to keep the wind out and also serves as a shelter for the dogs in rough weather. The door is closed by a snow-block. Side platforms of snow extend each side of the door to the bed platform on which are placed the seal-stove, stores and cooking ustensils.

While the men are finishing the porch and other work outside, the women take the bedding and household goods from the sled and put the house in order for the night. The bedding is arranged on top of several thicknesses of caribou skin placed over dried sealskins to shields them from the snow underneath. The seal lamp or stove is next put in position on the snow shelf that extends from the bed platform to the door and is then filled with blubber and lighted. A rack made of sticks and strings is arranged over the lamp from which the cooking pot, filled with snow, is hung and from which water for drinking and making tea is obtained.

Iceberg, Admiralty Inlet, August 1911.

The Eskimos dogs.

The Eskimo stove.—The Eskimo stove consists of a flat receptacle made of soapstone, hollowed out, or of tin, filled with raw seal blubber, and furnished with a wick made of dry pulverized moss, mixed with hair and vegetable cotton that is spread along one edge of the stove and dips into the blubber. The wick is smeared with blubber and lighted by matches if they have any, or by flint and steel. As the wick gets warm, the blubber in the stove gradually melts and keeps feeding the wick, which absorbs it and gives forth a soft, clear yellow flame. Deer fat or bear grease is also used to feed the lamp when seal blubber, which is the best, is scarce. At first the flame from the lamp is small, but the heat soon warms up the stove or tin, when the blubber melts without much attention. As the flame increases the wick requires considerable attention and manupalation so that the flame may burn evenly round the lamp and not cause smoke. The stove made of soapstone or tin, varies from ten to thirty inches in length, the average width being about 18 inches. The stove is about 12 inches from back to front and about four inches deep at the back and the bottom slopes out to an inch in depth at the front, where there is a narrow lip along the width of the front on which the wick rests. The semi-frozen blubber is stripped off the carcasse of a seal with a knife, pounded between two stones to facilate the extraction of the oil, and placed in the stove. A reserve of blubber is generally carried in an old biscuit tin or other receptacle.

The Kettle.—The more remote Eskimo suspend an oblong kettle of soapstone over the flame to melt ice and cook food, but most of the natives now have access to traders and have largely given up the use of the stonekettle and use a tin one in its place, which they make themselves and weld together without solder using paper to fill the joints.

Eskimo Food.—Cooked food with its accompanying broths is prefered to raw, but when blubber is scarce the Eskimos live on raw meat of the seal walrus, caribou and salmon.

Eskimo Dogs.—While the women are arranging the interior of the snow-house the men are busy unharnessing the dogs, feeding them with large lumbs of seal or other meat, which they devour ravenously after their long fast. As a rule the dogs are fed only once every two days, and on the march they often go four or five days without eating. The Eskimos sometimes feed the dog one by one, inside the igloo to prevent them from fighting or the stronger ones from eating the portion of the weaker ones. If the night is stormy a couple of blocks of snow are put to windward of the hole from which they are taken, thus making a shelter for each dog. But many of the dogs disdain such shelter, and on the coldest stormy nigths lie curled up on the highest place available, evidently prefering the cold to being drifted under by the snow in the holes prepared for them. The dogs have very thick, long woolly hair which protects them from the intensest cold and also from the teeth of their companions. An Eskimo dog, which seems to be a direct descendant of the wolf, lives about 8 years; if he does not succomb to hardship and hunger before that age. He begins to pull in the sled when six months old and is not much good after six years. They often go mad from prolonged hunger and hard work, and many die from worms and from having their intestines pierced by pieces of bone from the frozen meat which they devour too ravenously, when over hungry.

The dog-whip.—The Eskimo, as a rule, is very considerate to his dogs and only treats them violently at rare intervals. Then he uses the long dog-whip made of sealhide and often 40 feet in length to some purpose, and the dogs retain for all time the remenbrance of it. When a dog is to receive punishment on the march, he is pulled back by his single trace to the sled and fastened there; the driver can then give him, his individed attention with the whip. A great deal of dexterity is shown in using the whip and a lot of time is spent by the Eskimos in practicing with it. A good whip handler has at least four or five different cuts, and can hit within an inch or so anywhere inside the length of the long lash. The blow is terrific.

Handling Eskimo dogs.—The leading dog, which is chosen for his intelligence, keen scent and courage, answers more or less satisfactorily to the word of command, and is followed by the other dogs. The usual commands are to swing right or left, to start or to stop. They are made to lie down by swinging the long whip-lash to and fro over them. The dogs are strong, active, acute of hearing and very intelligent Each pack or team has its leader, generally the strongest fighter, and he immediately buries his teeth in the hide of an insubordinate. If the dog is punished with the whip, he yelps loudly and generally passes it on by biting savagely the dog nearest him. If they smell a seal-hole, the whole team with one accord will dash for it at full speed and nothing will turn them before they reach it. The dogs are thus of great assistance to the Eskimo in locating seal-holes, which are generally covered with snow and indistinguishable on the ice-covered surface of sounds. They are also a great protection against bears and other dangerous animals. The usual team consist of six to eighteen dogs and they are harnessed to the sled each dog to a single trace of varying length, spreading out in the form of a fan, with the result that the traces are always getting tangled into a single knotted rope, as the dogs re-cross one another. Stops have to be made every few hours to untangle the traces The harness is made of flat pieces of

A good team of Eskimos dogs.

Eskimos Sledges.

sealhide, sewed together into loops which are drawn over the dogs head and which pass under its forelegs and over the back to which the single trace is attached. Were the dogs harnessed in pairs two and two, they would be able to draw heavier loads and smaller teams would be required, but for Arctic work the Eskimo fashion is the best.

The Eskimos dog.—The Eskimo dog according to Darwin, derives its origin from the wolf, which animal it greatly resembles. It has a broad forehead, short pointed ears, sharp pointed nose and bushy tail which curves over its hindquarters. Its coat is very thick with a woolly undercoat which it sheds in summer. This type of dog is found all over the northern latitudes of Asia, Europe and America, including Greenland, between latitudes 60° and 80° N. The Arctic dogs of Lapland and Siberia are smaller than those of Greenland, Kamschatka and the Arctic islands of America. They are generally of a gray colour of different shades, sometimes with black stripes, but they are of all colours black, red, brown and gray. The Greenland and Baffin Land dogs are often all white, sometimes with black faces. Their voice consists of a mixture of bark and wolf-like hawl. At sunset and sunrise they often gather in groups and set up in union, a series of long drawn hawls, which in the bleak, desolate wastes that they inhabit has a very weird and ominous, wolf-like effect. They are very handsome and courageous and will follow and attack caribou, Polar-bear and musk-ox with the greatest impetuosity and elan. The Polar bear will always run from a pack of Eskimo dogs, where flight is possible. In fact the Polar bear fears the dog more than he does man.

The Eskimo dog leads a very slave-like existence of a hard work, hunger and usage from man and his own species. His life is one long term of drugery and fighting. The Eskimo dog spends 8 months of the year drawing heavy sleds over rough ice, which often cuts his feet till they are raw and bleeding. He sleeps out in the open, in the coldest and wildest weather and often goes four or five days without food. In the short summer months he is turned adrift to forage for himself and ekes out a precarious existence on the remains of seal, walrus, narwhal, salmon and birds which he hunts along the shore. He is responsive to good treatement and becomes very affectionate. But he is a great thief and is like his Eskimo master quite unfitted for civilisation and will hunt and kill all fowls sheep, pigs, and cattle that come in his path.

Arctic sledge.—The best sledge for the Arctic is one consisti of two runners made of hardwood planks, fourteen feet long, 10 to 12 inches high, and 3 inches thick, steel shod. These runners should be 2 feet apart and lashed with steel wire to cross pieces 3 feet long; the runners should be curved at both ends of the sled. This makes a long wide sled, very strong, and enables the load to be packed low, which prevents the load from constantly overturning on the rough and hummocky ice that is everywhere met with along the shore; its length makes it useful for bridging cracks in the ice. On blare ice and soft wet snow the steel shod runners are better than those shod with whalebone or ivory. The runners are coated with seal blood and then sprayed with water which forms a coating of ice on the bottom and greatly reduces the friction and consequent pull on the dogs. The steel runners should be iced daily. The usual load is from 800 to 1200 lbs, and the average rate of travel s about 3 to 4 miles an hour. A good dog will pull twice its weight over good ice and snow.

That night I managed to eat a little of the old buck seal and slept a little, as the pain was easier. The roof of my mouth was raw from munching on the rock-like biscuit, which nearly choked me when I swallowed it. The igloo was very cold, owing to our smal supply of seal oil.

February 8th.—I was gradually getting stronger and after a breakfast on seal and biscuit, which took me about two hours to negotiate on account of the soreness of my mouth and the toughness and hardness of the fare, we started again towards Scheming which was about 40 miles distant to the south.

Béland Peninsula.—We made about ten miles that day, as the ice was good and my strength was gradually coming back. We camped on the sound opposite a small point in the centre of what I named Béland Peninsula in honor of my good friends in Quebec.

We passed a better night although the igloo was very cold, and we could not sleep much. I had trouble in getting into my frozen sleeping bag.

February 9th.—We covered about 20 miles over good ice, but the cold was intense and a strong wind blew from the north. I froze the sole of my left foot when building the gloo, but my health was greatly improved although the roof of my mouth still pained me greatly when eating.

Sassilook.—February 10th.—We made an early start in the dark in order to reach Scheming that night, as we had no more seal meat for the dogs. The day was bitterly cold with a strong north wind blowing. As we neared Sassilook, at the entrance to the Scheming narrows, the ice became very much broken and crumpled into large, overlapping cakes, due to the swift action of the tide, which flows through the narrow passage, which is also blocked by several islands. For 5 or 6 miles we pulled and tugged on the sled, which nearly came to pieces under the strain, and we were finally compeled to throw off half the baggage on the ice, in order to let the dogs, which were weak from constant heavy pulling and hunger, make any headway. We left only such things as the wolves could not devour.

Reach Scheming.—When we reached the site of the Eskimo camp on the western side of the narrows, we were all fagged out and wet through with perspiration. An Eskimo who had just returned from hunting seal near the island, helped us build the igloo and gave us some seal meat for the dogs and some blubber for our stove.

I could not eat much but slept soundly from sheer fatigue, in spite of the intense cold. My relief at reaching Scheming after all the trouble. Illness and cold that I had undergone and at being able to feed the dogs was so great that I passed the best night that I had known since leaving Arctic Bay.

Scheming.—Scheming is the name given by the natives to the northern island in the narrow channel which runs north and south between the head of Admiralty Sound and the large bay which I have named South Bay. Scheming is about 100 miles from Arctic Bay.—The channel of Scheming is about 5 miles wide at the north end, 3 miles at the southern end. The narrows are about 15 miles long The principal island lies north and south in the northern end of the channel, and is five miles long and from one to three miles wide. In the eastern channel formed by the island and the mainland are three small rocky islands. A mile and a quarter south is another island, about 1½ mile long and a mile wide on each side of which is a channel about a mile wide and which is probably deep enough for a schooner to pass. Both islands are low and rocky being not over 100 feet high and consist of granite gneiss boulders and black rock that looks like diorite, with many cracks or fissures but no veins of quartz visible.

At the northern end of the larger island is a large open water-hole, about 3 miles long by 500 yards wide which is open all the year long as the swift rush ot the tides in the narrows prevents the water from freezing over. Here the natives shoot and harpoon seal all winter, on the west side of the island is another water-hole, open and smaller, about 100 yards long and 30 yards wide, which first begins to freeze over about the middle of February. The natives' summer camp is opposite the southwest corner of the island, in an angle of the shore. The winter camp is about ten miles further south, round the corner and on the north shore of what I named West Bay, near a small lake, where they are more sheltered from the north wind.

I found four Eskimos living at Scheming whose names were Coodnoo, a fine elderly native with a very good disposition, Skennikar, Attitar and his brother Eejoonia, with their wives and children.—Four men, five women and two children; eleven all told.

The country east of the narrows consists of high, easy sloping rocky hills, from 200 to 300 feet high, which slope down gradually to a gravel and boulder beach along the shore.

On the west side of the narrows the country is low for about ten miles back from the water, where high rocky hills begin, 1000 to 1500 feet high. The low land between these hills and the narrows is about 100 square miles in extent and consists of black rock, gravel and boulders.

I spent 24 days at Scheming, from January 11th to March 7th, spending the time in fox-trapping, exploring the country and waiting to catch enough seal to carry us over the long land trail to Igloolik.

The first day Peewiktoo and I visited the long open water-hole which runs along the east side of Scheming island, for the purpose of catching some seal. But the wind was so cold and the fog so dense that we could not see 50 yards ahead of us. Peewiktoo saw one seal come up and blow for an instant, but the wind was too cold for the seal to remain for any length of time above water, and after wandering around the hole for some hours, we returned to the igloo which we had built at the Eskimos regular summer camping ground. On February 12th, I sent Peewiktoo with the sled to bring up the baggage we had left on the rough ice in front of the narrows. I spent the day in changing the magazine on Peewiktoo's old Mauser rifle and cutting off superfluous wood from the barrel, making it lighter and easier to shoot with.

I spent the days exploring the country all round the narrows, where I set out fox-traps, but only caught one fox. I saw no signs of any deer tracks and only a few hare tracks. Whenever we kill a seal, we would see the next day, the tracks of foxes which had been attracted by the smell of blood. The whole country round Scheming at this time of year, was desolate in the extreme. There was no game to hunt, as the caribou had gone south towards the sun. Seal were scarce and very hard to kill, and the country seemed hopelesly devoid of animal life.

In the summer time, Scheming is a Paradise for hunters, as it abounds in caribou, salmon, geese, duck, ptarmigan and hare. There are also wolves and foxes. Occasionally a Polar bear will wander down Admiralty Sound from the north in search of seal. Coodnoo told me that he once killed a female bear and her cub on our camping ground. Seals are plentiful in the waters of the sound, but there are no walrus narwhal in those waters.

Seal hunting.—Most of our days were spent in hunting seal, as without seal meat we could not continue our journey. We used to hover round the open water-holes for days armed with rifles and harpoon, after seal, where we suffered greatly from the intense cold and biting winds from the north, which often froze our feet, hands and faces. After much trouble and exposure we succeeded in killing 8 seals in the Scheming water-hole and five more in the middle of West bay. Of these we only managed to capture the bodies of five, as the remainder were swept away under the ice by the swift current before we could secure them with the harpoon, and it was very dangerous work approaching the edges of the water-holes, as the ice was thin and rotten, and to fall in the water meant certain death. On February 15th, I killed a seal and when trying to recover it froze my face and one foot and, what was worse, lost the seal.

After my experiences at Scheming, at Igloolik and my bitter sufferings when hunting seal there in winter time, I could fully sympathise with the poor Eskimo who has to endure this disagreable and plaintful task every winter, in order to provide food for himself and family. They have to stand for hours at a time on the exposed ice in the coldest weather, often in a howling northerly blizzard, with the thermometer 40 or 50° below zero, in the hope that a seal will come up to blow and give the waiting and motionless Eskimo a chance to shoot or strike it with his harpoon. If he misses his shot and the seal escapes, the Eskimo knows how bitter will be the disappointment of his starving and shivering wife and children when he returns empty-handed to his cold and fireless igloo. If the seal are scarce and the weather unfavorable it means slow death from starvation and cold for all of them. And the seal are by no means easy to catch, as they are very wary and suspicious of any noise or movement on the ice, and their sense of smell is also keen. So the hunter must keep perfectly still for hours over the hole waiting for the "ploof", "ploof" of the animal when it comes to the surface to breathe; and yet he must ever be on the alert all the time, and ready to plunge his harpoon through the thin ice that crusts the hole, into the seal's head, or it will blow quickly and dive again. He has to remain in a crouching posture all this time, the harpoon in his right hand and the line in his left, and he generally leans his forearms on his thighs as he crouches, waiting to strike. Often he ties his knees together with a piece of seal string to keep them from trembling and knocking together with the cold; his hands and feet become numbed with the frost and as he has to face the wind from the leeward side of the sealhole, his face often gets frost-bitten. The near approach of a seal is heralded by strings of bubbles formed by the animal empting its lungs as it rises to the hole. It first rises to the surface of the water under the ice, gives a quick blow and disappears. If nothing has aroused its suspicion, it shortly returns and gives two more short blows with its nostrils and dives as before. If on the second visit to the hole, nothing has happened to alarm it, it will rise to the surface a third time, and begins a series of long respirations, accompanied by a strong blowing noise as the air is expelled and inhaled by its lungs. That is the moment to strike, and the patient Eskimo noiselessly brings his spear directly over the centre of the hole, and strickes down with all his force, hoping to drive the barbed point into the brain and immediately kill the seal. This often happens with small ones, but with the large ground-seal, a single blow rarely kills it and a struggle between man and the wounded beast then takes place. The barbed head of the harpoon is arranged to slip off the point once it has entered the flesh and remains jammed in the body of the animal, at right angles, so that it can not be drawn out again. To the barb is attached a long and very strong line made of sealhide, and the moment the animal is struck the hunter lays down the handle and devotes his attention to the line which is attached to the struggling seal s body by the barbed lance head. If the seal is a large one and struggles much, a turn of the line is taken around the waist, and the hunter braces himself for an encounter in which the seal is sometimes a victor. Great care is necessary in paying out the line, for many a finger has been lost by becoming tangled in a loop. The violently struggling seal must soon breathe, and to do so is compelled to rise in the hole; then the hunter endeavours to drive the pointed rod into its brain, and usually does so very quickly. The hole in the ice is then enlarged with the ice-chisel on the end of the spear handle. When the seal has been hauled on the ice, a number of ceremonies are gone through in order to propitiate its spirit and to please Nuliayok, the goddess of the marine animals. One of the customs consists in bursting the eyes of the dead seal by a prick from the point of the knife or harpoon, so that th e seal's spirit may not see that it is being taken to the snowhouse. Another custom is to fill the mouth with snow and to squirt it in the form of water over the seals' body, if it is the first seal killed at the hole, or otherwise no more seal will come to that hole to be killed.

When the ice has frozen over the sea surface for several miles out from the shore, many of the seals, especially the older ones, remain in the shallow waters of the bays and sounds. In order to do this, they are compelled to keep holes open so that they may breathe from time to time. They form these holes either by enlarging natural cracks or, when such do not occur by scraping with their front flippers a conical hole large enough to admit their body and with a few inches of ice to spare at the surface, through which is a small round aperture in the centre. By lying down on the ice and applying one's eye to this aperture and gazing steadily down into the water one can often see several seals darting about under water in chase of the small fish on which they feed. A seal does not necessarily confine itself to one or more breathing holes of its own, but uses those of other seals, so that the chances of killing a seal at any particular hole vary. As the winter draws on, the Eskimo forsakes the edges of the ice-floe and hunts his seal at these holes. In order to find the holes he employs his keenest scented dog, harnessed, who soon smells a hole and drags his master to it. If the hole appears well frequented, and the Eskimo is anxious to obtain the seal, takes the dog some distance away and ties him securely by its trace to the ice. He then returns to the hole, and clears the snow from about its opening, replacing it with a thin fresh slab of ice on which the centre of the hole is planly marked. If he intends to remain until a seal comes, he often erects a low wall of snow to windward and sometimes places a block close to the hole as a seat.

Seals igloos.—As the time approaches to bring forth her young, the female seal enlarges a hole usually in rough ice where the snow is deeply drifted, and there clears away the snow about the hole forming a flat domed house sufficiently large to accomodate herself and her young. The pups are born in March and April. When born they have a glistening white coat of soft hair, and they increase very rapidly in weight. Eskimos, bears and foxes dig the young seal out the snow houses on the ice, as their flesh is very fat and tender, and the skin with the fur on makes very warm socks and mitts.

The Arctic Seals.—There are many different kinds of seals, but the most common is the ringed or Jar seal (Nitchick, Eskimo) which is the common small seal of the coasts. It varies in size, markings and colour according to its age which has led to its being classed under several species. Its flesh is the chief article of diet of the natives the year round, while its skin, when escraped with the hair left on, is used for clothing, tenting and bags; when dressed by removing the hair it is used for covering of Kayaks and for boots. Its blubber, which the Eskimos burn in their lamps, is the chief source of artificial heat. The skin has a very strong and unpleasent odor, and its scientific name is Pagomys Foetidus, or the Stinking Seal. The liver is very good to eat when fried, especially with bacon. The meat is dark red and full of thick dark red blood.

Big seal.—There is also the Bearded, Big, Ground or Square-flipper seal (Oogjook-Eskimo) which is found on all the coasts. The Big Seal is next in size to the walrus, and its capture always bring gladness to the Eskimos, as it provides a large amount of meat blubber, while from its hide is cut an exceedingly strong line used for dog-traces, whips, harness and other purposes. The dressed skin which is usually thick and tough, is used for the soles of boots, for covering kayaks, tentings etc. The flesh of the Oog-jook is courser in texture, but less fishy in flavor than that of the smaller seals. The liver is said to be somewhat poisonous, and is not often eaten.—The OOg-jook or Big-seal brings forth its young, which are born near an opening in the shore ice, about a month later than the Ringed Seal, that is, in April and May.

Bladdernose Seal.—The Hooded Seal or Bladdernose (Nitshivok, Eskimo) is a large and ferocious seal, second in size only to the Big Seal or Oog-jook. It is found at Pounds Inlet and is caught on the ice-floes off the Newfoundland and Labrador coasts. It is not known in Hudson Bay. It produces its young about two months later than the Harp Seal and usually in the ice further off the coast.

Harp Seal.—The Harp, Saddleback or Bedlamier Seal, (Kirolik Eskimo) supplies nearly two-thirds of the seals taken annually off the coasts of Newfoundland in the spring, when the females give birth to their young on the floating ice of the Arctic Pack. The harp seal is more common along the Atlantic coast of Labrador. These seals commonly travel in bands, and are known by their habit of frequently leaping from the water. $2.00 for the skin and $2.00 for the blubber is the average current price in Newfoundland.

Harbour Seal.—The Harbour, Ranger or Freshwater Seal (kassigiak, Eskimo) is found, but is not plentiful, on all the coasts. It is found usually about the mouths of the rivers, and in bays and fiords. It is found also in the larger lakes of Labrador, Baffin land and Melville peninsula, where many of them reside permanently, living on the salmon and trout in those waters. The young, unlike those of other seals, are produced in July on the rocks about the banks of rivers. The skins are greatly prized by the natives owing to their fur-like character and beauty of colour. The flesh and blubber especially of the older and larger fresh-water seals have a disagreable odor and taste.

Fur Seal.—The Fur Seal as known in the shops are not found in the Arctic islands waters, being common to the Pacific shores of Siberia and Alaska and Behring Strait, where the temperature of the ocean is warmer.

On February 18th, a party of Eskimos, with three sledges, arrived at Scheming, having come from Ponds Inlet, by way of Arctic bay where they had gone to spend Christmas and to exchange their skins and ivory for cartridges and tobacco. They brought me half a barrel of biscuits and 10 lbs of tobacco, which I divided amongst Peewiktoo and the different natives at Scheming who had supplied me with caribou and seal meat. This party consisted of Izzîkakto his wife and child, Mannil (Izzikakto's son) wife and baby, and Nootararia (a brother of Coonoo's with his wife and small baby. They proceeded the same night to the winter camp at West Bay.

On February 20th all the Scheming natives left to hunt bear

A big Arctic Seal.

The Scheming Eskimos.

on the Gulf of Boothia, Prince Regent inlet and Lancaster Sound. One party went to Bernier Bay, the head of which is separated from West Bay by a narrow neck of low land only a few miles across. A second party went to Prince Regent inlet and a third up Admiralty Sound to Cape Crawford.

On February 24th, a heavy gale blew from the north accompanied by a snowstorm. On February 26th when we were returning from laying fox-traps on South Bay, one of our old dogs died, leaving us with only seven.—On March 1st, I visited all the traps I had laid round the narrows, but could find only a third of them, as the dogs could not find the trails owing to the fierce, cold wind that was blowing, accompanied by a thick snowfall.

Eskimos arrive.—On March fifth, five Eskimos arrived from Aggo and Igloolik on their way to Ponds inlet to exchange their furs, skins and ivory for tobacco and cartridges. They would have to travel over 1000 miles before they reached their homes again. Their names were Ikkipiria and wifes; his son Otar wife and two children; Coggan, wife and two children; Zillakappsi, wife and two children; and Takkowa and wife. A party of fourteen altogether and five sleds.

These natives remained at Scheming for a couple of days and then with the exception of Coggan and Takkowa proceded on their way to Ponds Inlet.

Takkowa, a son of Eetotiardjo, the head man of Igloolik had came from there with a sledge, runners and all, made out of frozen walrus skin. He had come to get an old wooden sled with whalebone runners which Izzikakto's son, Mannil, had left for him at Scheming.

Coggan had come all the way from the native village of Ai-villik, situated a few miles north of Wager Bay on the west coast of Hudson Bay, where Captain Comer, the commander of the American whaling schooner "Era" had made his headquarters during the past 30 years. Ai-villik is about 200 miles down the east coast of Melville Peninsula, from Igloolik and about 370 miles from Scheming. Coming by way of Aggo, as Coggan had come, it was much further. Coggan was a fine handy man and spoke some English, which he had picked up from Comer's men. Coggan is a man of about 35 years of age, very intelligent and a great traveller. He had visited Marble Island, Southampton island, Wagner inlet, and had crossed from Wagner inlet overland to the Back's river, traversing the same country where Mr Caldwell, some years ago, disappeared and was never heard of again.

Coggan and Takkowa returned with me to Igloolik.

CHAPTER VI

TREMBLAY'S TRIP—SCHEMING TO IGLOOLIK—THE ESKIMOS—THE ARCTIC CARIBOU

Leave Scheming.—I left Scheming on March the 7th and it was the first fine day we had since leaving Arctic Bay. The sun shone bright and clear and there was no wind. For several hours during the day I got so warm from walking and running and from tugging at the sleds that I was obliged to shed my coat. I picked up some fox-traps along the route that I had laid south of the camp. When the sun went down it got bitterly cold again. The thermometer at Salmon River registered 52° below zero on this day.

Party, etc.—Our party consisted now of Peewiktoo and wife, Takkowah and wife, and Coggan his wife and two small children and myself. We had three sleds, two of which were drawn by seven dogs a piece and our own sled drawn by nine dogs, as I had purchased three dogs from Skennikar and Attitar at Scheming, each dog costing me 5 Victor Fox-traps. We also had the bodies of five seals to provide us with food and fuel on our long journey, from Scheming to Igloolik, a distance of 160 miles, of which 100 miles were overland with very heavy going for the sleighs. As it usually requires two seals to feed and provide fuel for an Eskimo, his family and his dogs for a week, this was not much in the way of food and fuel for a party of eight persons and 23 dogs for two weeks of hard travel before us. But as caribou were said to be plentiful along the valley that we were to traverse, I trusted to be able to kill enough animals to keep us alive till we reached Igloolik. I did not know until afterwards, in view of our limited supply of cartridges, what a risk we had run.

Quartz veins.—It was my first intention to go to Aggo and thence by way of Fury & Hecla Strait to Igloolik, but when I heard from Takkowah of the existence of a large vein of milk-white quartz near lake Taseonia on Melville Peninsula, and also from Coggan of the existence of other quartz veins in that vicinity, I decided to press straight on to Igloolik in the hope that Wilson would follow me to Aggo and that I could join him there from Igloolik, when we could both prospect the country where the quartz veins were said to exist.

Leave Seal and note.—I left a large seal, weighing fully 300 lbs for Wilson at Scheming with a note of my movements, as I knew from my own experience, that when he reached Scheming he would be likely to be short of food for his dogs.

Fall River—We marched south all day and pitched camp on the south point of West Bay. Opposite this point, on the east side of South Bay, a fairly large river about the size of Salmon River runs into South Bay from Borden Peninsula. There is a heavy rapid and fall, strewn with large boulders, near its mouth. This river contains no salmon. I named this the Fall River.

The ice on the narrow sound was good and level, and covered with a thin coating of snow, but the sleds were heavy for the dogs and I pulled at the sled all day.

South Bay.—March 8th—On this day, which was very cold, (the thermometer registering 48° below zero at Salmon River and with a bitter north wind blowing, we made good progress and camped on the ice about seven miles from the southern shore of South Bay. I have seen no map that shows correctly the shape and formation of the southern extremity nor of the western shore of Admiralty Sound. The south-western shore line of the sound consists of bluff reddish sandstone cliffs that rise sheer outthe water to a height of 2000 feet, and which are pierced by narrows ravines. Opposite Béland Peninsula the west side of the sound consists of black rocks similar to the diabase and pyrrhotite shown to me at Arctic Bay. This chain of black rocks, mineralized in places, runs S. W. and N. E. from the west side of Melville Peninsula and Fury & Hecla Strait across the southern end of Brodeur Peninsula to Arctic Bay, Adams and Strathcona Sounds and obtrudes through the predominant granite and red sandstone and limestone formation. Northeast of Strathcona Sound the Black rock disappears and the formation is of red and yellow sandstone, limestone and gravel. This intrusive belt is highly mineralized in places, as at Strathcona Sound there is a large deposit of iron pyrites, heavily charged with sulphur, assays of which have shown it to contain platinum.

Methods of information.—I made careful notes and sketches in my pocket-book throughout my journeys in these localities, of the shape, formation and relative bearings and distances of the different bays, sounds, headlands, and prominent landscape features. Wherever possible I used the compass, altho I had no means of determining the magnetic variation, having neither sextant or artificial horizon, but the position of the sun at noon gave me the true south, and the Pole Star at night, gave me the true north and by these two indications I was enabled with the daily estimates of the distances travelled in a direct line, to come to a fairly accurate decision as to my latitude and direction of route. This added to such known positions as Igloolik, Cape Hallowell on Fury & Hecla Strait, Cape Kater and Prince Regent Inlet, Cape Crawford, Arctic Bay, Albert Harbour, the entrance to Murray Maxwell Bay or other points on existing charts, have enabled me to plot in with aproximate accuracy the contour and direction of the coast-line and landmarks over which I travelled, much of which had never been travelled before by a white man. I also got the most intelligent Eskimos of each locality to draw for me sketch maps of the various bays, rivers and sounds that I was unable to visit personally; and this they did with great readiness and ability, as they were conversant from boyhood with the localities sketched and also were in the habit of hunting there every year. They could thus give me full particulars of each place with the approximate distances and general directions and bearing. Peewiktoo, Tootillik, Coonoo, Eetotiardio, Coggan, Panniloo, Akkoomalee, Tom Lasso and Okai were especially useful and helpful in this work.

Preparation of map.—As I went along, I named the most important features on the land as they appear on the map that accompanies this volume, being assisted by Mr Reader in the preparation of the map and in the selection of suitable names.

Repairs.—We spent the next day and night (March 9th) at the same igloo, as we had to mend our sleds, the wire fastening of which had become slack and one of the runners on Coggan's sled was broken.—March 10th.—Made an early start and travelled all day while the sunlight lasted. We reached the southern shore of the sound about noon and our journey over the land began. No sooner had we struck the land, that our troubles commenced. The land which was overlain by snow from a foot to two feet deep, was full of holes. There was a thin crust on top of the snow, through which men, dogs and sleds kept continually breaking, with the result that our progress was slow and laboured. The dogs would sink in up to their bodies in the soft and crusty snow, and we were kept busy all that afternoon tugging at the sleighs and adjusting the dogs' harness. I saw plenty of caribou tracks for the first time, and it cheered me greatly, as it meant food for men and dogs. The weather continued on very cold and the sun shone each day only for a few hours at a low angle over the Southern horizon. The cold north wind of the previous days had moderated.

Zig-zag River.—We did not follow the riverbed, as it was too zig-zag in its meandering course over the flat land, but cut across the land till we reached the point where the river comes out from the mountains, on the east of the valley. We camped on the ice of the riverbed, close to the foot of the mountains. This river, which I named the Zig-zag River, is about 75 yards wide and teems with salmon in the summer. The river forks about three miles below where we camped, one short branch running S. W. for a few miles and then terminating in a large lake, which the Eskimos told me was about 6 miles long and 3 to 4 miles wide. I called this lake Zig-zag Lake. The main branch of the Ziz-zag river runs for a much longer distance through the mountains to the S. E. About 5 miles west of the Zig-zag river, another river which I have named the Sarpoolik River, enters South Bay. The Sarpoolik river runs from a very long lake, which lies about eight miles to the S. W. This lake I named Long Lake, as it is about 30 miles long and from 3 to 4 miles wide, so the natives informed me. When going to Aggo the Eskimos travel fast with their sleds over its flat, frozen surface. This lake is also said to be full of salmon. About four or five miles distant from the S. W. end of Long Lake is another lake, called by the natives Ibbi-sauk-too. Between the two lakes is a low round hill which forces them to make a short detour to the south. A river flows from the lake Ibbi-sauk-too into the north eastern arm of Aggo Bay, and this river and lake are also the home of many fine salmon. The distance from Scheming to Aggo is about 95 miles which makes Scheming about the half way house between Arctic Bay and Aggo.

Fare during trip.—During this trip I lived entirely on half-cooked or raw seal and caribou meat unaccompanied by biscuits, tea or sugar; as what little I had of those luxuries I gave to the Eskimos, in order to make the trip, if possible, somewhat more attractive for them. I drank only hot or cold water, and often ate snow instead of water. This was the fare, varied occasionally by a meal of rotten walrus or salmon, eaten frozen and raw, on which I lived for the next two months until I reached Salmon River on May the tenth. I gave the Eskimos all the biscuits, tea and sugger that I had, as I wished to show them that a white man could live on the same food as they were accustomed to, and also to make them feel that they were not being treated with injustice. To do them justice Peewiktoo and Tootillik did not want to eat the biscuits and drink the tea by themselves and always offered me some. But I always refused, altho I must confess that my mouth often watered for a hot cup of tea at the end of a hard day's march, when I was shivering with cold in the igloo. I suffered intensely all the trip from a raging thirst, and the temptation to drink of the tea, while it lasted was sometimes often almost too great for me. I often reduced my share of the seal meat, whenever I saw that Peewiktoo and Tootillik were over-tired and hungry, as they were always so willing, patient and enduring that I hated to think that they were undergoing so much hardship and suffering on my account, when they might have been having a much easier time at Ponds Inlet near the ship.

Peewiktoo.—Peewiktoo is the nicest boy in the world. Frank good-natured, smilling and cheerful with perfect manners and a most agreable soft voice. He is a great travelling companion and a first-rate hunter. He and Tootillik and I used to spend many happy hours in the igloo, laughing over the bad places we had come through or talking over past hunts of polar bear, caribou, musk-ox and walrus. I would tell them tales of the whitemen and women to the south, and of the wonderful inventions of civilisation, which they never tired of listening to. Whenever I related anything that seemed especially wonderful they would say "Ah-mai" which means "You don't say so", or "Kappenna-mee", "Strike me", which is the nearest approach to an oath in the Eskimo language. The Eskimo do not swear, and blasphemy is unknown to them. When annoyed they either shrug their shoulders or, what is better laugh and turn the matter into a joke. They have a very volatile and naturally happy disposition, which is fortunate, as a serious and taciturn race would promptly go mad and die during the long, gloomy winters of desolation and despair in the Arctic. But although volatile, the Eskimo is capable of deep feeling and attachment and Peewiktoo and Tootillik would both sit silent, sometimes, and cry for an hour at a time over the recent lost of Peewiktoo's father at Arctic Bay and of Tootillik's favorite sister who had died at Button Point. At this time I used to comfort them as much as was possible and tell them that we all must die at some time and used to joke in order to make them laugh—when they would gradually brighten up and break into smiles again.

The Eskimos.—The Eskimos are very much like children and require to be treated with firmness, kindness and justice. They are responsive and grateful for kind treatment and forget neither a kindness nor an injury, or a broken promise. They are keen observers and have a great sense of humour and mimicry, like children. They have been taught to fear the white man, but in their own hearts, they feel themselves quite as capable and efficient. In this they have reason as in the Arctic there are few white men who become as proficient in hunting seal or driving dog-teams as the Eskimos, or who have the happy, philistophical disposition, endurance and courage to live for any continous length of time through the long, dark and cold winters in constant squalor and discomfort. As neither trees nor vegetables grow in the Arctic, the Eskimos live entirely upon a meat diet, sometimes half-cooked, more often raw. The weaklings die; only the fittest survive. The infant mortality is great.

Diseases.—The Eskimos do not live to a great age, rarely beyond 60 years and at 50 both of them, man and woman, are old and wrinkled; they often die from acute indigestion from eating a surfeit of frozen meat after several days enforced fast when game is scarce. They also suffer a good deal from ulcers and boils from eating raw meat of the seal and caribou which has become tainted and rotten in the stone caches through exposure to the sun's rays during the short summer months. They also suffer from rhumatism, dysentry, typhoid, and bronchial troubles and occasionally from inflammation of the lungs. Their eyes become inflamed with dirt and weakened by the glare of the sun on the snow in summer. Some become totally blind with cataract. There are a few weak-minded, but the blind, the cripple, the insane and the aged are fed and cared for when possible. However if food is scarce these are the first to go. Many die from accidents and exposure. Some are killed by rocks falling when hunting, others through the ice-pans on which they are hunting seal, breaking away and being blown out to sea; whole parties of Eskimos have been swept away and have perished in this manner. Others again are upset and drowned from there flimsy and unstable kayaks when engaged in the perilous pursuit of the vicious and dangerous walrus. Polar bears have disposed of some. But hunger and starvation are their greatest enemies and are responsible for the majority of deaths.

Effects of Meat diet.—The unlimited use of stimulating animal food, on which the Eskimos are fed from infancy, induces at an early age a highly plethoric state of the vascular system. The weaker over-distended vessels of the nose quickly yield to the increased impetus of the blood, and an active haemorrhage or nose-bleed relieves the subject. As the same causes continue to be applied in excess at frequent intervals, and are followed by similar effects, a kind of vicarious haemorrhage at length becomes established by habit; and having no small share in maintaining a balance in the circulalory system—the nose acting as a safety valve.

Ice-Walking.—Even on dangerous ice-whether consisting of constantly moving unstable blocks or of thin, young ice,—the Eskimos-men, women and children alike-will walk fearlessly, though cautiously in spring or Fall from the shore to a ship or out to the seal holes. Their method is to go in a line ahead, or by single files the leader or perhaps one or two of the others carrying a spear with which they constantly try the ice before them, keeping their legs as far apart as possible so as to bear upon a large surface and carefully avoiding the parts that look black, when a white man would not dare to venture out at all until the ice became more stable or thicker by several inches.

Religion.—"Strickly speaking writes Peary, the Eskimos have no religion in the sense in which we used the word. But they believe in the survival of the person after death, and they believe in spirits—especially evil spirits. It may be that their lack of any idea of a beneficent God, and their intense consciousness of evil influences, result from the terrible hardship of their lives. Having no special blessings for which to be grateful to a kind Creator, they have not evolved a conception of Him, while the constantly recurring menaces of the dark, the bitter cold, the savage wind, and gnawing hunger, have led them to people the air with invisible enemies. The beneficent spirits are those of their ancestors (another Oriental touch) while they have a whole legion of malevolent spirits, led by the Tornarsuk, the great devil himself."

Beliefs in devils.—"They are constantly trying to propitiate Tornarsuk by incantations and when they kill game, an offering is made to him. The devil is supposed to have a knee appreciation of these habits. On leaving a snow igloo the Eskimos are careful to kick the front out of it, that the evil spirits may not find shelter there, and when they throw away a worn-out garnment it is never left intact, but is torn in such a way that the devil may not use it to warm himself. A comfortable devil is presumably more dangerous than a shivering one. Any sudden and unexplained barking or howling among the dogs indicates the invisible presence of Tornarsuk, and the men will run out and crack their whips or fire their rifles to scare away the invader. When the ice presses hard against the ship an Eskimo will call on his dead father to push it away; when the wind blows with special violence, ancestors are again appealed to. Passing along a cliff, on a sledge journey, a man will sometimes stop and listen and they say: "Did-you hear what the devil said just there?" I have asked the Eskimo to repeat to me the word of Tornarsuk up there on the cliff and I would not dream of laughing at my faithful friends at such a time; the messages of Tornarsuk I receive with a respect for gravity."

All calamities and bad-luck are attributed to the malevolent spirit of Tornarsuk, the evil god, or Nuliayok the evil goddess, working to the detriment and misfortune of the hard-living Eskimo and many rites and superstitious practices are performed to propitiate these malignant spirits.

Fear of death and evil spirits.—The Eskimo fears the death of others more than their own, as they believe that the spirit lives after death and that if they displease the spirits of dead men or animals they will be persecuted and haunted by their angry spirits or by the Evil gods that preside over them. For that reason, they are careful to place beside the dead body the favorite weapons or the implements used by the dead. They perform various rites and ceremonies over the bodies of animals which they have killed. They never use an igloo or a toopik where a death has occured. The body they drag out by a rope, as they do not like to handle human remains, and cover it with stones or blocks of ice to keep off the weasels, foxes and wolves. But wild animals or the dogs generally manage to find access to the body and to devour it The after-world of the Eskimos is like that of the Turks and other Orientals a material abode where the spirit enjoys the good things of the life without too much trouble in seeking them.

Burial customs.—The sledge and kayak, with his weapons and articles of daily use are placed besides the grave of the hunter and sometimes his favorite dogs are struggled so that they may keep his spirit company in the unknown world. If the deceased is a woman, her lamp and the little wooden frame on which she has dried the family boots and mittens are placed beside her grave. A little blubber is placed there, too, and a few matches so that the woman may light the lamp and do some cooking on the way; a cup or old kettle is also provided that she may melt snow in case she becomes thirsty. Her needle, thimble and other sewing things are placed with her in the grave. In the case of a child a tiny kayak or sledge is carved of wood or bone, together with a miniature set of bows and arrows and other small articles are placed in the grave.

If a death occurs in a tent, the poles are removed and the tent is left to rot on the ground. It is never used again. If the death occurs in a permanent igloo, made of stones, earth and whalebone, the habitation is vacated and not used again for a long time. The name of the lost one is rarely, if ever, mentioned, and the relatives of the dead observe certain formalities in the matter of food and clothing for some time afterwards.

Eskimo devils.—The Eskimos are very superstitious and believe in all kinds of devils or evil spirits, which belief has been common to all the races of the world before the teachings of Christianity appeared on earth. They have many kinds of devils which they call Toonga, Toongasuk or Toopilan. These devils assume various forms when they appear. Sometimes a devil will appear half-man, half-polar-bear, 8 or 10 feet high; half-man and half-seal, or in the guise of the Toopilan, a small round person with huge popping eyes, like a seal's, with a circle of flame round its body. These devil forms are undoubtedly the result of imagination engendered of weakness, hunger and cold, during the devilish hours of fog and obscurity in the long winter months. In the death like stillness of the frozen northland, rocks, hills and ice-blocks assume all kinds of weird and fantastic shapes, in the dark drifting fog. One suddenly sees a dark object loom through the fog which appears as if it were jumping about with some omnious intent, causing a nervous person to start and to feel a creepy sensation crawling up his spine. On closer inspection it proves to be only a rock or a solid block of ice past which the dense fog is drifting. It is the fog that is moving and not the object. But to an Eskimo doseing on his sled, and weak from a long exposure and fasting in the darkness and intense cold, to his fevered imagination it appears as if he had suddenly seen the devil of his early dreams, and he makes all haste to camp and invokes the aid of an Angakok or conjuror to rid him of the evil spirit that is dogging his footsteps and preventing him from killing game. The Eskimos never see these devils in the summer months of continual sunshine. Then all is brightness, gaiety laughter and love making. The young Eskimo wanders hand in hand with his girl wife, singing and laughing from sheer gladness of heart, over the bare brown hills where the song of birds and the rush of running brooks fill the air with music. The air is clear and bracing, wild flowers of every hue enliven the view, bumble-bees hum and dart from flower to flower while across the sound are magnificent ranges of snow-clad peaks outlined relief against the blue sky. The flowers however in the Arctic are scentless. The rivers are full of silvery salmon, the lakes and ponds are alive with luscious trout, and wild geese and ducks that have come from the far-away south, are flying around in flocks. Caribou in their soft brown summer coats are sleek and fat, and easy to approach. In the summer time the Eskimo abandons the sea-shore and wandering over the hills and lakes-strewn vallies lives on the flat of the land, while the days of only too short sunshine last. As winter approaches, he returns to the shore and, travelling by sled over the new-formed ice, reaches his winter quarters, where he resumes the work of seal hunting, fox-trapping, and the chase of the Fall caribou and the polar bear.

Eskimo origin and physique.—The Eskimo is distinctly of Mongolian origin, having come no doubt from the north of China by way of Behring Strait. They are very robust and healthy and have finely muscled bodies and limbs. They are very strong and of great endurance, being able to travel for days without food in the coldest of weather. They are generally short and sturdy, but there are many five foot ten inches in height and they sometimes weigh 180 lbs. Their eyes are black and their hair, which is allowed to grow long as a protection to the face and ears, falls like a horse's mane over their shoulders. Their jaws and teeth are very strong from constant chewing of tough meat and leather. Mr Charles Dawson, according to a recent newspaper despatch from London, who found the famous Piltdown skull, has made another surprising discovery of profound interest to anthropologists. He has discovered that a certain Eskimo tribe have literally more backbone than the rest of humanity that is to say, they have in their waists one extra joint (or vertebra) to which small ribs are attached.

Mr Dawson has lately been making an examination of various skeletal remains brought from the Arctic regions and has made the remarkable discovery that both the man and woman of an Eskimo tribe show this abnormal development of the backbone.

Mr Dawson is of opinion that what is an occasional abnormality in men and the higher apes has become, through survival of the fittest, a fixture and permanent character in the tribe in question.

The extra joint lends strength and suppleness to the waist, and thus enables the members of the tribe to be more dexterous in the management of the Eskimo canoe or "kayak".

This canoe which is only five or six inches deep, and on which the Eskimo formerly depended for their living, is mainly governed as to balance and righting powers by the muscles of the waist.

Eskimo Women.—The women when young are often quite good-looking, with fine busts and arms, but their legs are generally warped and stunted from their habit of constantly sitting on their haunches, with their knees doubled under them in the igloos. The women are great adepts with the needle and for the making of skin garnments and sealskin shoes are unsurpassed. They sew away from them, instead of to them, as is the custom of white women, and use the thumb for the thimble-finger. They also use the feet to hold garment that they are working on, gripping the garment between big toe and second finger. They are very skilful in piecing the different coloured skins together, making all kinds of fancy patchwork and trimmings; and they use the sinew from the back of the deer for thread, which is unbreakable and does not rot from moisture. They also use the sinew from the tail of the narwhal. Where formerly they used bone punches for sewing, they now use steel needles obtained from the traders, using the three cornered needle for making leather shoes. They do not use scissors for cutting out the skin to pattern, but a semi-circular double-edged blade with a wooden handle, which is generally made from saw steel. The best winter clothes for the Arctic are those made by the Eskimo women from the skins of seal, caribou and polar bear, and consist of an inner shirt and troussers of caribou skin with the hair inside against the body; long socks of caribou, hare or young seal with the hair inside; an outer hooded cloak of caribou skin which fits on over the head; outside trousers made of polar bear or caribou skin, warm fur-lined mittens and outer shoes or kammings of sealskin with soles made of the heavier skin of the big seal or Oog-jook. Add to these a pair of snow-goggles for use in the months of March, April and May and the winter costume is complete.

Mariage customs —The Eskimo women are excellent mother and bestow the greatest care and affection upon their small children which they carry in a fur-lined bag strapped to their shoulders. They are firm believers in the trial marriage system. A young man and woman will start housekeeping together without any preliminary ceremony other than that of setting up their own separate toopik (tent) after the young man has made a present of some kind to the father of the bride or the nearest male relative. If they find that they are not suitable to each other, they try again, and sometimes several times until mutually satisfied, when they generally form a permanent marriage. Two Eskimos will sometimes exchange wives at intervals or lend each other their wives when one of them is going hunting or on a long journey. They are usually very devoted companions, and the wife's advice is often listened to and followed, although the man is always master and the head in his own household. Among the Eskimos the woman is as much a part of the man's property as his dog or sledge-except in some rare cases, where the woman, from natural force of character and good judgement, takes the lead in deciding as to the movement of the household. The cause of the militant suffragettes has as yet made little headway in this region, possibly perhaps, because a woman can almays find a husband to support her. The women are much more jealous than the men and a woman will often pull the hair of another woman and administer a good drubbing if she thinks the latter is encouraging the attentions of her husband. Wife-beating is sometimes indulged in, but not often. If two men want to marry the same woman they generally settle the matter in good humour by a trial of strength, either by wrestling or by pounding each other on the arm to see which can stand the punishment the longest. The winner gets the woman who is sought for as a wife, not so much on the score of good looks as for her ability to tend igloo, sew clothes, and help with the dogs and hunting. If a man grows tired of his wife he tells her there is no room for her in his igloo and she returns to her relatives or takes another husband. In these cases the husband keeps one or all of the children or the woman takes them with her. Sometimes a good hunter will .have two wives, generally where the first wife has no children. Each woman keeps her own fire alight and the two wives are the best of friends and great company for each other when the man is away hunting. But most of the natives have only one wife as the number of women is about equal to that of the men. In fact it may be said that the customs of the Eskimos are the outcome of the climatic conditions and of the very rigorous life they lead, and white men who have lived among them for any length of time generally concede that the less so-called improvement or change in the marriage customs the better.

The Eskimos do not have many children, two or three being the usual number. The woman always retains her own name. Tootillik for instance will remain Tootillik, whether she had one husband or several. Children do not address their parents as father as mother, but call them by their names, though sometimes very small children use a diminutive which corresponds to our "mamma'—The husband often calls the wife "Kooma' when addressing her.

The girls marry very young, sometimes at the age of twelve. In many cases the marriages are arranged between the parents when the children are quite young; but the boy and girl are not bound, and when they are old enough they are permitted to decide for themselves. In fact they can make several such decisions without losing caste. Cases have occured where an Eskimo has kidnapped another's wife, but in these cases the injured husband, when he is attached to his wife sometimes retaliates by killing or wounding the interloper.

Eskimo children.—The Eskimo children are delightful with their tawny skins, rosy cheeks and sparkling black eyes. They are very intelligent, quick and observant. They delight in games and in learning to acquire the accomplishments of their elders. They are dutiful, respectful and obedient and the smallest gift of a toy, ornament or useful article renders them very grateful and happy. They are very fond of their parents who rarely, if ever, treat them with aught but the greatest kindness and affection. —The Eskimos do not lie or steal, unless they have been corrupted and taught to do so by their white visitors. They are hospitable, kindly, tactful and considerate. They share the produce of their hunting with their less fortunate companions, protect, and feed the cripples and helpless, are every devoted to wife and children and are always occupied in the chase or busy at some occupation. They are staunch companions and faithful to their trust.—With permanent central trading stations established at easely accessible points where a vessel could call once a year and where they could be sure of being able to exchange the produce of their chase, on just and equitable terms, for a liberal supply of cartridges, tobacco, sugar, flour, biscuits, matches, needles, timber for kayaks and sledges, knives, cooking ustensils, dried apples and potatoes, tea, molasses, coffee, salt, rifles, axes, and other necessities, and some medical attention, the Eskimo would be perfectly happy and contented.

They are a magnificent race of people, without the need of any system of intricate laws or administration, and are indispensable to the development of the Arctic regions and they are quite unfitted for contact with the white man's civilization. They are now full-fledged members of the Great Canadian commonwealth and deserve the protection and encouragement of that Government.

The greatest tribune to the Eskimos character is the fact that all white men who have lived among them became greatly attached to them, invariably admire their wonderful courage, patience and endurance, and when the time comes sincerely regret to parting and always look forward with pleasure to meeting them again.

They have a rich and wonderfully expressive language and when soap and water are obtainable are cleanly in their habits and dispositions.

Deserve better treatement.—The Eskimos are the guardians of the north and are the only hope of salvation for the crews of shipwrecked vessels and exploring parties stranded in those inhospitable regions. They are a peaceable people and most friendly disposed and are deserving of much better treatement that they have hitherto obtained from the scheming traders and white men's scum that have occasionally visited their shores and who have unscruspulously plundered them of their hard-earned produce of the chase.

Excellent mechanics & carvers.—They are natural-born mechanics and can take a complicated watch, rifle or modern mechanism to pieces and put it together again with unfailing skill. They are excellent carvers in ivory and their kayaks or skin canoes are marvels of ingenuity. They know the habits of every thing that moves on land or swims under the water, and when hunting, take advantage of each animal's weakness or peculiarities. They are a most sociable people, being intensely fond of music, singing and dancing which they indulge in whenever the occasion presents itself. They eat and sleep at all hours of the day and night and will often be seen or heardi ndulging in a noisy game of football, made out of a sealskin bag stuffed with feathers, at 2 o'clock in the morning in a moonlight winter's night with the thermometer 40° below zero. The men indulge in wrestling harpoon-throwing and whip practice for amusement. The women and men play cards, dance and sing in chorus together. The children play at catc's cradle with a piece of string, ball and stick and other games, including the harnessing of the puppies to miniature sleds and the building of miniature igloos of snow and stones. They visit each other's igloos at all times of the day and night, which they enter and leave without formality. As they are much intermarried, and men and woman have generally been married several times, the relationship of the children is most confusing and impossible for the white stranger to understand. When a woman has no children, another women who has several, will give her one, which she will treat and bring up with as much care and attention as if it were her own. They form one large happy family, and although the dialect of one tribe will differ from that of another, the main language is the same and is understood by all.

Eskimo writing.—The Eskimos have adopted a form of syllabic symbols, somewhat resembling shorthand, which was invented for them by the reverend E. J. Peck, the Anglican Missionary at Cumberland Gulf, and which they use for the purpose of writing letters in pencil to one another.

The Devil Supreme.—From leading a life of constant suffering and danger the Eskimos have come to believe in the potency of the devil or devils rather than in the Goodness of God, of whom until the Anglican Mission of Cumberland Gulf was established, they had no conception. In the long sunless winter the whole Arctic Region—cliffs, plains, ocean and glaciers—is covered with a monotonous pall of snow that shows up a ghostly gray under the pale light of the northern stars. When the stars are hidden by the dense fogs that continually envelope the region, all is black, void and soundless. The dense blackness and awful stillness of the brooding landscape are deathlike in their effect upon the senses. When the wind is blowing, if a man ventures out, he seems to be pushed backward by the hand of some invisible and icy fiend, while a vague, unnameable menace seems to lurk everywhere around him. It is small wonder, then, if the Eskimos believe that evil spirits or devils walk upon the wind and lurk behind the dark forbidding rocks and glaciers along the shore.—As Tom Lasso once put it "No God, only devil", looks after the Eskimo with an empty belly and starving wife and children in the freezing igloo. And in the freezing temperatures, biting wind and misery and extended gloom of an Arctic winter, it is hard work to explain to this keenly logical race that God is supreme and Eivil only subsidiary. They believe in the existence of the soul (Tarninga) and in its continued existence after death, and they make solitary visits to the grave and address the spirit of the departed one. They believe that if a child is named after the spirit of a dead relative, that spirit will enter the child's body for a year and endow the child with its good qualities. They also believe that the spirit of a dead Eskimo or animal, if offended by them through failure to observe the innumerable taboos imposed upon them by the Angakoks, will complain to the Goddess of Evil named Nuliayok, that presides over the marine animals and this goddess will cause tempests to arise and prevent them from killing enough animals to feed them and their families. They believe in a future state, or Heaven, which they call Skinniktanga (the place of Sleep). There are there planes of Heaven for the soul of a man and four for the soul of a woman. Heaven in their estimation, is a place that is always bright and warm, where there is plenty to eat, and drink and clothes to wear with little to do.

Murder and Suicide.—Murder is rare and, then, it generally occurs over the possession of some woman. Incurables sometimes commit suicide, which is not considered a crime, and their spirit after death is credited as going to an upper plane in Heaven along with the other good people.

Lunatics and Criminals.—If an Eskimo becomes dangerous obnoxious or insane the men of the band consult together, and one or more of them are deputed to remove the criminel or lunatic in which case they are held blameless in the matter. Sometimes they will marron an obnoxious individual on an island where they leave him to die of starvation. Their Hell, called Sen-nalies at the bottom of the sea and is presided over by Nulia-yok, the Goddess of Evil. The souls of evil Eskimos go to Senna when they die, and are tormented for a time by the father of Nulia-yok. The souls of transgressors of the numerous Taboos or rites and rules prescribed by the Angakoks or Seers, and the souls of men that have been carried away on the ice-floes also spend sometime in Purgatory or Sen-na.

Nulia-yok Goddess of Evil.—All the Eskimos believe in a supreme goddess, called Nulia-yok, who, according to Eskimo tradition, was an Eskimo maiden who would not marry any of their young men. She was finally wooed and won by the Fulmar, a Gull who persuaded her to accompany him to his island as his wife. On arriving there Nulia-yok found that she had been deceived and that the deceithful Gull's splendid home was nothing but a nest of sticks perched upon the bare high rocks, without any shelter from the winds or snow. The abundance of food that he had promised her turned out to be nothing but rotten fish and she was continually being jostled by the other Gulls, so that she had difficulty in keeping her place on the rock.

Very soon Nulia-yok managed to send word to his father Anautelik, and he came in his boat and took her away during the absence of the Fulmar. When the gull discovered his loss, he caused a great storm to spring up and Anautelik, to preserve his own life, threw his daughter overboard, but she clung to the gunwale, so he cut off her fingers, one by one, to make her let go. As her fingers dropped into the sea they changed into the whale (ak-bin) the walrus (aivil) the big-seal (oog-jook) and the small seal (nitchiek) and so gave origin to the sea-animals. Her father next knocked one of her eyes out, after which Nulia-yok let go her hold of the boat and her spirit went to the world beneath the sea, where she became Queen and lived in a house built of stones and whalebones and where she was guarded by her husband, the dog. Nulia-yok can not walk, but "hunches" over the ground with one foot beneath her body. Her father Anautelik was also drowned later and now lives with his daughter wrapped up in his tent cover and employs his time in torturing the souls of the wicked. The souls of the sea-animals go to join Nulia-yok at the bottom of the sea, after death, after having remained for three days besides the body. For this reason, when a seal or sea-animal is killed the Eskimos puncture its eyes so that it may not see that it is being taken to the igloo; as otherwise the soul might be offended and cause trouble by complaining to Nulia-yok. For this reason, a great deal of respect is shown to the bodies of sea-animals when they are slain and is the origin of a number of taboos in connection with them. If the soul of a sea-animal makes complaint to Nulia-yok her hands swell and she revenges herself by bringing ill-luck or sickness upon the Eskimos. But if all the ceremonies are properly observed the soul of the dead animal is propitiated, and other animals will allow themselves to be killed by such considerate people.

Taboos.—The various taboos that have been formulated by the Angakoks for observance by the Eskimos when dealing with the skins and bodies of slain animals are well describded by Mr Low in his "Cruise of the Neptune" and by other writers.

When the taboos have been broken they can only be condoned by open confession in the presence of an Angakok, who, through his familiar spirit, which he invokes in a state of self-induced hypnotic trance, reports the confession to Nulia-yok and the sin is forgiven.

Another Eskimo legend.—There is another legend in connection with Nulia-yok and her husband, the dog, which explains the origin of the Indian race and the white people. The story runs that Nulia-yok was deceived by the dog, who took the form of a young man a sort of corollary to the myth of Leda and the Swan when her father found her with a litter of red and white puppies he was very angry, and placed her with her strange progeny upon an island, sending food to her by the dog. Later he drowned the dog and brought her food in his Kayak. Nulia-yok in revenge for the death of the dog set the pups on her father who killed him. Being now without means of getting food for herself or her pups, Nulia-yok made two large slippers and placing the white pups in one and the red pups in the other, set them afloat on the ocean before a north wind, which blew them south, where they landed and the white pups became the ancestors of the white folks and the red pups the ancestors of the Indians who have always been the hereditary foes of the Eskimos who style themselves Inyooit, the word Eskimo or Esquimaux having been applied to them by the first French Settlers in Canada, meaning "Eaters of raw Fish".

Pookimma—There is also a goddess of the land animals called Pookimma, who appears to be the same personage as Nulia-yok under another name. The Polar bear is under the special protection of another goddess called Angea-garak-takto, who lives in an iceberg. When killed the jaw, skin and claws of a Polar bear must not be brought into an igloo or harm will come to the woman.

Familiar Spirit.—Every Eskimo, man or woman, has a familiar spirit belonging to one of the sea or land animals, through whom he or she may intercede with Nulia-yok, Pookimma or Angea-garak-takto for forgiveness for the non-observance of the prescribed taboos in order to ward off ill-luck or disease.

Exorcising the Devil.—If an Eskimo becomes ill, he has evidently offended some spirit by a breach of the taboos, and his only chance of a remedy is to go to some Angakok, who holds a seance at which all the women sit in a circle and sway their bodies and shout Atté-Atté and clap their hands. The Angakok goes into a trance and foaming at the mouth, goes through some weird performance on the ice outside, sometimes chansing the Devil with a harpoon, till the suffered announces himself better or the Angakok returns with the report that he has killed the Devil.

The Angakok.—The Angakok or the medecine-man, is believed by the Eskimos to possess supernatural powers, whereby he can charm away sickness, lighten the displeasure of Nulia-yok, when she sends famine or misfortune to the band, put the Evil eye (Ee-zinga) on those who displease him and also see into the future. The Angakok can also by gazing fixedly at a knife or some other object that he holds before his eyes, throw himself into a self-hypnotic trance when he foretells where seal or caribou can be found when the band is starving. By a remarkable coincidence Pannikpa, a noted Angakok at Botton Point actually predicted the correct number of a herd of caribou that would be found the next morning in a certain ravine, on Bylot Island. Three Eskimos went hunting the next day and not only sighted a herd of nine caribou in the ravine, corresponding to the number and place indicated by Pannukpah the night before, but killed some of them and returned with two sledloads of meat to the hungry but rejoicing band of natives assembled there.

The Tonwak.—The Angakok is supposed to derive his powers from the aid of a familiar spirit, called his Tonwak, which usually assumes the form of some animal, often that of the walrus.

Novitiate.—To become an Angakok it is necessary to receive instructions in the mysteries from some other Angakok, and usually more than one take part in the instruction and initiation of the candidate. During his preparation, the novice cooks his own meals and eats nothing that is prepared by any other hand than his own. During the period wanders about in solitary meditation.

After being instructed, the novice has a series of incantations performed over him by the assembled Angakoks, who dance round him uttering charms. He is then taken to his home and left for several days in solitude, during which time he meditates and prays for his tonwak to appear; this usually happens after several days, when all that remains to make him a full-fledged Angakok is to learn certain words that are unknown to the uninitiated. An Angakok will perform all kinds of conjuring tricks for which he prepares behind a curtain or screen, such as taking a knife and plunging it through his koolitang into his heart, while his face becomes deathly pale, his eyes are staring and wide-open and blood drips apparently from the wound. Of course it is a trick, but sometimes it looks too real to be pleasant. Peary, writing of the Angakoks, says: "There is no chief among these people, no men in authority; but there are medecine men who have some influence. The Angakok is generally not loved he knows too many unpleasant things that are going to happen, so he says. The business of the Angakok is mainly singing incantations and going into trances, for he has no medecines. If a person is sick, he may prescribe abstinence from certain foods for a certain number of moons; for instance, the patient must not eat sealmeat, or deer meat, but only the flesh of the walrus. Monotonous incantations take the place of the white man's drugs. The performance of a self confident Angakok is quite impressive—if one has not witnessed it too many times before. The chanting, or howling, is accompanied by contortions of the body and by sounds from a rude tambourine made from the throat membrane of a walrus stretched on a bow or bone. The tapping of the rim by another piece of ivory or bone marks the time. This is the Eskimo's only attempt of music. Some women are supposed to possess the power of the Angakok—a combination of the gifts of the fortune teller, the mental healer and the psalmodist, one might say."

"Once years ago, my little brown people got tired of an Angakok one Kyoahpahdo, who had predicted too many deaths; and they lured him out on a hunting expedition from which he never returned. But these executions for the peace of the community are rare."

Through contract with the white man the Eskimo is gradually losing his belief in the Angakok and their practices, but in the absence of their remedies and amusements the Angakok is likely to remain their chief counsellor and physician for many years to come. The Cumberland Sound natives call God "Goti".

Charms.—Amulets in the shape of small pieces of skin or cloth are sewn to the under coat by the wife of an Angakok to ward off sickness and to bring good luck. Many of these are decorated with beads. The tip of the deer's tail is sewn to the tail of the coat for success in hunting and when sewn to the coat of a boy ensures his becoming a successful hunter. A gull's feather dipped in the drippings of the lamp is placed between the harpoon and spear line, and so carried to the ice, where the hunter sucks the feather and spits in the water in order that the walrus may not known that it is being hunted. The dried skin of a newly born lemming, when attached to the float of a walrus harpoon, prevents the animal from attacking the boat when wounded, and the skin of a lemming carried in the boat ensures safety. There are numerous other charms used, together with invocations and songs for success in hunting.

Tattooing.—The married women are often tattooed on the face and hands to denote the tribe to which they belong. Tattooing is not practiced by the men.

Piblokto—The adult Eskimo are often subject to a peculiar nervous affection, a form of hysteria, which they call piblokto. It seems to result from the morbid brooding over absent or dead friends and relatives or a fear of the future. The woman suffers from it most, and when attacked with this form of hysteria, they will begin to scream and tear off their clothes and then run about screaming and gesticulating like some one possessed. They will rush out of the igloo in the coldest of weather, and run about, almost nude, on the snow and ice till they fall exhausted. If the other Eskimos did not forcibly bring them back they would certainly be frozen to death. The attack usually ends in a fit of weeping and then the patient quiets down, the eyes are bloodshot, the pulse high, and the whole body trembles for an hour or so afterwards.

Eskimo dogs and foxes suffer also from piblokto and although the symptoms seem to resemble those of hydrophobia, it does not seem to be dangerous or infectious. The dogs suffering from piblokto are generally shot. Several Eskimos at Ponds Inlet lost nearly all their dogs from this desease.

Eskimo astronomy.—"In a country," writes Peary, "where the stars are visible for many weeks at a time it is not strange perhaps that they receive much attention from the natives. The Eskimos are, within barbaric limits astronomers. The principal constellations visible in northern latitudes are well known to them and they have given them their own names and descriptions. In the Great Dipper they see a herd of celestial reindeer. The Pleiades are to the Eskimos a team of dogs pursuing a solitary polar bear. Gemini, they describe as two stones in the entrance of an igloo. The moon and the sun represent to the Eskimos, as to some of our North American Indian tribes, a fleeing maiden and her pursuing admirer."

Classification.—Dr Frank Boas, who made a special study of the Eskimos of Baffin Land and Hudson Bay, has applied the term of Central Esk mos to the tribes that inhabit Baffin Land, the Arctic Islands, Labrador, Hudson Bay and the North Eastern Mainland of Canada lying between the Mackenzie River and Hudson Bay. The natives of Greenland he describes as Eastern Eskimos and those inhabiting Alaska and the country to the west of Mackenzie River as Western Eskimos.

Central Eskimos.—The Central Eskimos number about 4000 and are scattered in small tribes, each tribe consisting of a few families, over a vast area that embraces some 3,000,000 square miles, most of which is treeless and inhabited only by barren ground caribou, musk-ox, arctic hare and other arctic game.

Similarity of tribes.—Scattered over such a wide area of country, with such poor means of communications, it naturaly follows that the Eskimo race is broken up into a number of small tribes that are distinguished one from the other by difference in dialect and by slight differences in manners and customs. These differences are, however, so surprisingly few, considering the conditions, that an Eskimo from the Atlantic coast has no difficulty in conversing with the natives of the west coast of Hudson Bay, or with those of Greenland. Their religious beliefs and ceremonies are also wonderfully alike. Everywhere, and only minor differences are to be seen in their sleds, boots, tents and implements of the chase which are largely due to the different materials available in the different localities. The language, beliefs, manners and customs of all the Eskimos with only slight modifications, are wonderfully similar.

Smith Sound Eskimos.—A considerable number of Eskimos, forming small communities, inhabit the east coast of Greenland from its southern end, near Cape Farewell, up to Upernivik at the southern end of Melville Bay, where a stretch of coast occurs until Cape York is reached, where are found the Eskimos of Smith Sound who formed the most northerly permanent settlement of the human race. These Arctic highlanders inhabit the region between Cape York and the great Humboldt glacier on the east side of Smith Sound, between Lats 76 and 79° N. These Smith Sound Natives are said to be of a specially fine type and have rendered Peary, Cook and other searchers after the North Pole the most material, and in fact, indispensable assistance in the matter of providing them with dogs, sleds, drivers and the meat of musk-ox and caribou which they killed on Ellesmere land in the vicinity of Hazen Lake and Lady Franklin

Fiord.—Peary when he reached the Pole in April 1909 took with him 49 Eskimos from Etah and Cape York and 246 dogs. The four Eskimos that reached the Pole with Peary were named Ootah, Oogueah, Seegloo and Ejingwah. Dr Cook who reached the vicinity of the Pole the year before Peary, also had with him as his sole companions, two young, Smith Sound natives.

Commander Peary, who has probably lived longer among the Eskimos than any other man, writes of these natives, and we can not do better than to repeat his words, as follcws: "The members of this little tribe or family, inhabiting the western coast of Greenland from Cape York to Etah, are in many ways quite different from the Eskimos of Danish Greenland, or those of any other Arctic territory. There are now between 220 and 230 in the tribe. They are savages, but they are not savage; they are without government but they are not lawless; they are utterly uneducated according to our standard, yet they exhibit a remarkable degree of intelligence. In temperament like children with all a child's delight in little things; they are nevertheless enduring as the most matured civilised men and women, and the least of them are faithful onto death. Without religion and having no idea of God, they will share their last meal with any one who is hungry, while the aged and helpless among them are taken care of as a matter of course. They are healthy and pureblooded; they have no vices, no intoxicants and no bad habits-not even gambling. Altogether, they are a people unique upon the face of the earth. A friend of mine calls them the philosophic anarchists of the North."

"I have been studying the Eskimos for 18 years and no more effective instruments for Arctic work could be imagined, than these plumb, bronze-skinned keen-eyed and blackmaned children of nature. Their very limitations are their most valuable endowments for the purposes of Arctic work. They exihibit, too, in marked degree all the Oriental capacity for imitation. Out of walrus ivory, in some respects their substitute for steel—and a surprisingly good substitute it is,—they will construct amazingly good models or copies of various objects, while it does not take them long to master the use of such tools of civilization as may be put into their hands. It will easily be seen how valuable and useful a quality this has proved for the purposes of the Arctic explorer. If he could not rely on the Eskimos to do the white man's work with the white man's tools, the labors of the Arctic travel would be tremendously increased and the size of his expeditions would be enlarged to limits that might be found unwieldy (and expensive) in the extreme. It has been a fundamental principle of all my Arctic work to utilize the Eskimos for the rank and file of my sledge parties. Without the skilful hand work of the women we should lack the warm fur clothing which is absolutely essential to protect us from the winter cold, while the Eskimo dog is only tractive force suitable for serious Arctic sledge work."

These Eskimos from Smith Sound are in the yearly habit of crossing Smith Sound and Ellesmere Land, from Flagler Bay to Bay Fiord, where they hunt the musk-ox and caribou that are numerous along the western shores of that island.

Eskimos formerly lived over nider area.—At the time of the Europen discovery of the northern parts of America, the Eskimos extended along the coasts considerably south of their present limits. They occupied the entire Atlantic coast of Labrador, and lived far along the north shore of the Gulf of St. Lawrence. The Eskimos and Indians have always been open enemies. With the advent of the whites, the Indians soon became possessed of firearms, which gave them a great advantage over their northern foes, who were compelled to retreat beyond the tree limit in the northern regions; here they were safe as the Indians can not live without firewood.

Hostility of Indians and Eskimos.—The Eskimos continued to inhabit the eastern part of the shore of the Gulf of St-Lawrence until about 1630, where they were expelled by the French and Indians. Captain W. Coats, in his notes on Hudson Bay, states that in 1748 the Iroquois sent to the Indians of Hudson Bay four captive Eskimos, to be used as human sacrifices at some great feast; that the chief of the northern Indians proceeded forthwith against the Eskimos of whom they captured seven and killed thirteen; the captives were sent south to the land of the Iroquois in what is now New-York state. Their southern limit is now Lat 54° N. in Labrador and at Churchill on the west coast of Hudson Bay in Lat 57° 30′ N. They are found along the East coast of Hudson Bay as far south as Cape Jones, at the entrance of James Bay.

In 1770-72 Samuel Hearne, who was sent by the Hudson Bay Company to investigate the rich copper deposits of the Coppermine River, accompanied a band of Chippewyan Indians journeyed from Churchill to the mouth of the Coppermine River in Coronation Gulf. These Indians were only induced to go to the Arctic coast on the chance of killing Eskimos. This they did, by surprising a band of Eskimos who were busily engaged in fishing at the first fall, above the mouth of the Coppermine River, massacring them all. This fall is named Bloody Fall to this day.

Northern limit of Eskimos.—No natives inhabit the Arctic Island north of Lancaster Sound although the remains of old encampments have been found on Melville Island, Byam Martin Island, Bathrust Island, and along the western shores of North Devon and Ellesmere Land. Occasionaly natives from Ponds inlet and Admiralty Sound, in North Baffin Island, cross Lancaster Sound in wintertime from Cape Crawford and North Somerset to Erebus Bay for the purpose of hunting musk-ox and polar bear, but they do not stay there for any length of time.

Number of Eskimos.—The population of the Eskimos living on the shores of Baffin Land are as follows:

North Shore of Hudson Strait	400
Davis Strait (Frobisher Bay, Cumberland Sound, Paddli Fiord and Home Bay.	470
Northern Baffin Inland (Ponds Inlet and Admiralty Sound)	480
Igloolik (Fury & Hecla Strait)	40
Total	1390

Tribal names.—The population of Aiwilling (Fullerton and Repulse Bay) is 140, and of the nechillingmiut tribe (Westward from Repulse Bay to Back River) is 450.

The natives of Ponds Inlet belong to the Tunungmiut tribe, and the natives of Admiralty Sound to the Tunurusugmiut tribe. Those from Igloolik are called Igloolingmiut.

European blood.—The natives of Ponds Inlet and Aiwillig have a good deal of Scotch and American blood in their veins through contract for many years with the whaling ships that used to visit these waters. At Ponds Inlet a young Scotchman from a Dundee whaler, whom the natives nicknamed Seebootika, the Harpooner, from his having killed several whales, settled down at the place and, taking an Eskimo wife, adopted the regular life of the Eskimos. He used to accompany them on all their hunting and fishing excursions and became an adept hunter of seal and caribou. Seebootika had two sons and two daughters by his Eskimo wife. The sons, died but the daughters are married to Eskimos and have children of their own. When the Scotch whaling station at Ponds Inlet was abandoned some years ago, Seebootika went to live in Cumberland Sound, where a French Canadian from Ontario is also said to have taken up his abode with the Eskimos.

White Eskimos.—The Norwegian explorer Steffansson, discovered in 1912, a tribe of white half-breed Eskimos, in Coronation gulf, into which the Coppermine River falls. Steffansson reports these Eskimos as having light hair and blue eyes, and with strong traces in their physique of their European ancestry. "It is" says Steffansson, "a fine, strong race of people who have up to the present, escaped the diseases that civilization almost invariably brings in its train to ruin the morals and physique of the savage races." These natives are clever and vigorous and they live exclusively by the chase and fishing, as caribou, salmon and seal abound in their contry.

Steffansson came to the conclusion that they were descendant from some Swedish or Norwegian explorers who had become stranted in the north. But there are no records of any Swedish or Norwegian expeditions having visited that part of the country since—Hearnes visit in 1771.

In 1819-22 Franklin, Hood, Back and Dr Richardson explored the shores of Coronation Gulf as far as Cape Turnagain in Long. 109° 25′ W.—In 1825-27 Sir John Franklin made another exploration of that region.—In 1838-39 the eastern portion of the northern coastline, between point Turnagain and the estuary of the Black River, was surveyed by Messrs Peter Warren and Thomas Simpson, who were outfitted and sent by the Hudson Bay Company for that purpose, when the search for a N. W. passage was in active progress.

None of those parties came in contact with such a tribe of half-white Eskimos.

The only Scandinavian to pass through Coronation Gulf since that time, was Amundsen in the Gjoa in 1903-06 when he successfully accomplished for the only time in historiy the navigation of the N. W. passage.—Collinson with the British ship "Enterprise", passed through Coronation Gulf in 1850-55 and Dr John Rae, under Admiralty orders, visited Victoria island, on the north side of the gulf in 1853 when searching for Franklin's party. Neither Rae nor Collinson reported meeting with any such tribe.

Franklin's party.—Sir John Franklin's expedition came to grief in 1847-48 when his ship the Erebus and Terror were beset in the ice in Victoria Strait and were abandoned on the 22d of April 1848. Sir John Franklin died on board his ship on June 11th, 1847. On April 26 th 1848 Capt Crozier and 105 officiers and men, the survivors of the original complement of 129 men, left King William's Island on their way to the mouth of the Back River. The Eskimos living at the mouth of the Back River told Dr Rae that about 40 white men reached the mouth of the river, having dragged a boat as far as Montreal island, where it was abandoned. The last of these survivors, according to the Eskimos, died shortly after the arrival of the summer birds in early June. Might it not be possible that the survivors of the balance of the party, perhaps even a scant dozen or so of the hardiest men of the expedition, struck west along the south shore of Victoria Island, towards the Coppermine River as offering the best hope of salvation, and meeting Eskimos there remained with them until they gradually died.

It seems more than probable that these half-white Eskimos discovered by Steffansson are the direct descendants of Franklin's men, since in the 66 years that have elapsed there would be at least three generations born and some members of each generation should be alive at the present day or and descendants of the party from the Whaleman, Whaling for years from Behring strait to Bank land in Beaufort sea. A good interpreter would perhaps be able to elicit a number of interesting facts from the older members of the tribe in regard to their ancestry, and it is even possible that some members of the Franklin Expedition may have survived for twenty or thirty years after throwing in their lot with the capable and friendly Eskimos being without provisions and guides. They would have had little chance of making their way across the barren and desolate regions that lies between Coronation Gulf and Great Bear Lake. Possibly however the severity and hardships of a few Arctic winters spent with the Eskimos may have so acted upon their minds and bodies, allready enfeebled by the hardships they had undergone and the despair they experienced at never seeing their homes and countrymen again may have caused them to die after a few short years.

What would be more natural than that they should divide into two parties, one party taking Franklin's old route by the Coppermine River, the Great Bear Lake and Mackenzie River, and the other going by the Backs River to Hudson Bay? Whichever party reached civilization first would report and send succour to the other, and they would have the advantage of two routes to safety and a better chance of securing enough game to feed themselves than if they were all in one large party.

Apparently from what the natives living at the mouth of the Backs River told to Dr Rae, in 1854, the Backs River party dragged a heavy boat with ropes, over the ice as far as Montreal island where they abandoned it and the Eskimos broke it up for wood to use for their sledges. The Eskimos said that many of the men fell on the ice and died in the dragropes from fatigue and cold. About 40 men reached the Backs River and died after the arrival of the summer birds, which would be early in June. McClintock two years later found a deserted boat, with two skeletons in it, on the west coast of King William Island.

The other half of the party probably crossed Victoria Strait and followed the ice along the south shore of the Victoria Land until they reached Dease Strait, which they crossed to the mainland and entered Coronation Gulf. The party was well provided with guns and ammunition and consequently had nothing to fear from the Eskimos. The weather in May is comparatively mild in those latitudes, seal are basking in hundreds on the ice and in June the rivers would be full of salmon and game and birds are plentiful on the land. It would seem therefore inexplicable that, under such conditions all the robust, young and hardy men of the party, which was composed of the pick of the British Navy, should have died in a few short weeks. It is much more likely that 30 or 40 of them, at least, survived for several years.

This party would be the most likely one to have taken with them the long and other official documents of the expedition. It is also quite sure that the fear of the Indians and the white men would deter the Eskimos from accompanying them into the interior, and without guides or provisions they could never make the overland journey.

For years past there have been rumours current that Franklin's men had founded a white race in the wilds of Northern Canada, and Steffanson's discovery may be a confirmation of that rumour.

Summer hunting.—In summer half of the natives travel on foot into the vast interior of their Arctic domain in search of caribou which are sleek and fat and easy to kill at that time of the year. They cache the meat and skins under stones at the places where the caribou are killed and removed them to the coast in the winter on sledges when the ground is covered with snow.— The other half remain by the sea-shore hunting seal, narwhal walrus and white whales in previsions for the coming winter. They cache the meat under heaps of stones along the shore for consumption during the long dark winter months. If the the cache is poor, the Eskimos will suffer bitterly from hunger and cold at the end of the winter and some adults and many children will die. In the months of March and April, when the sun is once more high in the heavens, they will catch the newly born seal in their snow hunts on the ice and also the polar bear as they emerge from their winter quarters. In May, June and July the sun is up day and night and the seal lie basking and sleeping in hundreds on the ice, and are then easy to approach and kill. The rivers are running and full of salmon, and large flocks of geese and ducks provide an agreable change to the never-changing seal diet of the long winter months.

Hunting seal on the ice.—A good deal of patience and some excellent mimicry is displayed in killing seals as they lie bashing in the warm sun. When one is seen lieing on the ice of the sound near its hole, the Eskimo approaches as near as possible say to within 500 yards, when he lies down on the soft wet snow and wriggles the remainder of the distance during this operation, great care is taken not to excite the animal's suspicion, and an advance is only made when the seal's head is down. A seal appears to sleep in short naps, and raises its head to look around every few minutes; when he does so the hunter hides his face, and with his arm and legs imitates the motion of the seal scratching or lazily rolling, at the same time mimicking the blowing and other noises made by the seals; by so doing he lulls suspicion, and is enable to crawl a little closer. It is a tedious and tiring process and the natives hands are often numbed with cold and their clothes wet through by crawling through wet snow or water on the ice. By advancing in this manner he gets within fifty yards of his prey, when he shoots it in the head. If he shoots and only wounds it, no matter how badly, the seal will instantly dive through the hole close by and escape or die in the water. When the Eskimo has no gun, he continues to close in until sufficiently near to kill it with his harpoon; this must, however, be done very quickly, for the seal displays wonderful agility in falling into the water when disturbed.

From this description it will be seen that even under the most favorable circumstances the providing of an Eskimo meal is not an easy task; in the winter when the seals are scarce and they only appear for a few second to breathe under a hole in the ice the operation is attended with a good deal of mental anxiety and physical suffering.

Spring-time.—With the advent of June the snow begin to melt and soon after the land bedomes bare. This is a period of trial for the house-wife; the sun's warmth causes the roofs of the snow-houses to leak, and they can only be kept up by a daily patching with loose snow, while the ground is not sufficiently bare for erection of the summer hut; it becomes a constant fight with the heat and water, terminated only by the roof falling in. The small and general filthiness of one of those deserted spring houses is better left to the imagination; it is indeed beyond description. During this time, while the ice on the coast still holds, the men are busily employed killing seals, whose skins are needed to repair the summer tent and to cover the Eskimo's boat or kayak. The men bring in the slain seals and skin them after which the skins are handed to the women to dress. If they are used to repair the tent, or for bags, they are simply dried by stretching them on wooden pegs about six inches above the ground.—Many Eskimos have an entrance extension to their sealskin tents made of transparent tanned sealskin, thick enough to keep out the rain but not the light which adds to the roominess and confort of their summer dwellings. If the skins are required to cover the kayak, or for boots, the hair is scraped off with an ordinary chopping knife, against the grain, and the film is removed from the inner skin. For winter boots, the hair is rotted off and the skin has a white colour.

The Kayak.—This is the time to repair, and if necessary to make new, wooden frames for the kayak. The Kayak is a long narrow canoe, sharply pointed at both ends, and entirely decked over except a small well near the centre sufficiently large for a man's body. The frame is of wood, and is covered with sealskins sewn together to make a watertight cover. The frame is made of thin strips of wood forming the gunwales and of five or seven additional strips, one of which is the keelson. These are kept in place by light ribs placed about a foot apart, with corresponding deckbeams. Considerable mechanical skill is displayed in the making of this frame which is all fitted together without the use of a single nail, wooden pegs and sinew lashing being alone used. As soon as the frame is complete, all the women of the encampment join in sewing on the sealskin cover, as the operation when started must be completed at one sitting, before the skin dries. The seams are made with a double lap, and are quite watertight. The skin shrinks on drying, and becomes stretched like a drum over the frame. Writing about the Kayak, Peary says, in his very interesting book entitled "The North Pole". "To my mind the skin cause of these Northern Aborigenes is, with its hunting implements, one of the most complete and ingenious manifestations of intelligence to be found in any aboriginal tribe. Over a light frame work, an almost infinite number of small pieces of wood defty lashed together with sealskin thongs, is stretched the tanned skin of seals, the seams being neatly sewed by the women, and then rendered watertight by an application of seal oil, and soot from the native lamps. The result is a craft of great buyoancy, grace and especial fitness and effectiveness for the purpose for which it is intended, that is to enable the hunter to creep softly and noiselessly upon seal, walrus or white whale. This canoe, while varying with the size of the owner and maker will average between 20 and 24 inches in width by 16 or 18 feet in length. It carries one man only.

The Harpoon.—The harpoon is the most useful weapon in the Eskimo's equipment, and accompanies him everywhere. With it he kills seals, walrus, narwhal and white whales, also salmon in the rivers and lakes. In winter he will use it to kill polar bear, when he has no cartridges or rifle. In former days it was made of walrus ivory and wood. Now it is generally made of heavy round half-inch steel rod about 3 feet long which fits in a round wooden handle about 2 feet long. The winter harpoon consists of four parts, the steel rod, the wooden handle, the barb, and the ice-chisel on the other end of the handle. The end of the rod is pointed and fits into a socket of the steel or ivory barb which is about 3 inches long. The barb is attached to several fathoms of strong seal line; and is secured to the rod by a short slip line. When a seal is struck the slip line is released and the barb or spear head is detached from the rod and enters deep into the animal's body. In striking a seal or other animal, the handle is held in the right hand and the line attached to the barb is coiled in the left. Immediately the animal is struck the hunter lays down the handle and devotes himself to the line. When the wounded animal rises to the surface to breathe, the hunter drives, if possible, the pointed rod into the brain and ends the struggle. The summer harpoon, which is used for hunting the seal animals from the kayak differs from the winter harpoon and consists of a stout wooden handle from 4 to 6 feet long; at one end it is tipped with ivory with a cone like socket in its upper side, into which a similar cone on the lower end of the ivory shaft or barb lies. The shaft is usually made from a single tusk from 12 to 18 inches long. The shaft is pointed with a pointed piece of iron. usually an old knife blade, which is let into a slit in the ivory to which it is secured by rivets. The harpoon is thrown at the seal, walrus or whale, and its weight is sufficient to drive the head completely through the skin; the head slips and separates from the wooden handle which floats away. The shaft which is buried in the animal is attached by a seal line to a sealskin bladder which is thrown overboard from the kayak. After a few wild rushes the animal comes to the surface, dragging the bladder along The native then either shoots, or kills with the lance. The lance is somewhat similar in construction to the harpoon, but is without the head, the ivory shaft terminating in a wide steel blade usually cut out of a saw or large knife, and is without barbs.

Duck dart—The other weapon of the kayak is the duck dart used to entangle the eider duck when they become fat and lazy in the late summer This consists of a light wooden shaft 5 or 6 feet long, with a trident of deer horn at its upper end. The pieces of deer horn are from six to eight inches long and about half an inch in diameter, their sides are notched by a number of barbs pointing downwards. This dart is very skilfully thrown many yards and entangles itself about the neck or in the wings of the ducks.

Bow and arrow.—The Eskimos are also skilful with the bow and arrow, which before they obtained guns and rifles from the whalers, they used regularly when hunting caribou, hares and birds. The bow they make out of caribou horn, the strings out of of deer sinew and the arrow of light wood tipsed with a knife blade. They also use a sling made of sealskin from which they will throw stones at birds a long distance off.

Eskimo fishing device.—The Eskimo method of fishing is interesting. The fish in the Arctic will not during the wintertime rise to the bait but are captured by cutting a hole in the ice and dropping in a piece of ivory carved in the shape of a small fish. When the fish rises to examine this visitor, it is secured with a spear. The Eskimo fish spear has a central shaft with a sharp piece of steel, usually an old nail, set in the end. On each side is a piece of deer antler pointing downward, lashed unto the shaft with a fine line, and sharp nails, pointing inward, are set in the two fragments of outler. When this spear is thrust down on a fish, the antlers spread as they strike the fish's back; he is impaled by the sharp point above him, and the sharp barbs on either sides keep him from getting away. "The char (?) of North Grant Land" writes Peary, "is a beautiful motted fish, weighing sometimes as much as eleven or twelve pounds. I believe that the pink fiber of these fish-taken from water never warmer than 35° or 40° above zero—is the firmest and sweetest fish fiber in the world. During my early expeditions in this region, I would spear one of these beauties and throw him on the ice to freeze, then pick him up and fling him down so as to shatter the flesh under the skin, lay him on the sledge, and as I walked away pick out morsels of the pink flesh and eat them as one would eat strawberries. In September 1900 with this fish, a party of six men and 23 dogs were supported for some ten days, until we found musk-oxen. We speared the fish in the way the Eskimos taught us, using the regular native spear."

Origin of Eskimos.—There is a theory, first advanced by Sir Clements Markham, ex-president of the Royal Geographical Society of London, that the Eskimos are the remnants of an ancient Siberian tribe, the Onkilon; that the last members of this tribe were driven out on the Arctic Ocean by the fierce waves of Tartar invasion in the middle ages, and that they found their way to the New Siberian Islands, thence eastward over lands yet undiscovered to Grinnell Land and Greenland. I am inclined to believe in the truth of this theory for the following reasons:

Physical characteristics.—Some of the Eskimos are of a distinctly Mongolian type, and they display many Oriental characteristics, such as mimicry, ingenuity, and patience and mechanical duplication. There is a strong resemblance between their stone houses and the ruins of the houses found in Siberia. The Eskimo girl brought by Mr Peary in 1894, was mistaken by Chinamen for one of their own people. It has also been suggested that their invocation of the spirits of their dead may be a survival of Asian ancester worship.

As a generally rule, the Eskimos are short in stature, as are the Chinese and Japanese. The women are short and plump. They all have powerful torsos, but the legs are rather slender. The muscular development of the man is astonishing, though their fatty roundness hides the differenciation of the muscles.

Eskimo language.—Their language is agglutinative with, complicated prefixes and suffixes, by which they extend a word to a considerable length from the original stem. In addition to their ordinary speech, they have an esoteric language known only to the adults of the tribe. I can not say where it differs from the other having made no attempt to learn it, and I doubt if any white man has been fully taught this secret speech, as the knowledge is carefully guarded by its possessors.

Better off in their own country.—The suggestions of some well-meaning persons that they be transported to a more hospitable region would, if carried out, cause their extermination in two or three generations. Our variable climate they could not endure as they are keenly susceptible to pulmonary and bronchial affections. Our civilisation, too, would only soften and corrupt them, as their racial inheritance is one of physical hardship; while to our complex environment they could not adjust themselves without losing the very childlike qualities which constitute their chief virtues. To Christianise them would be quite impossible; but the cardinal graces of faith, hope and charity they seem to have already, for without them they could never survive the six-month night and the many rigours of their home.

Customs should not be changed.—It would be worse than useless to attempt to engraft our marriage customs upon these naive children of nature. Should an Arctic explorer consider it as a duty to tell a young Eskimo that it is not right for him to exchange wives with his friend, it would be well for the explorer to have his supporting argument well prepared beforehand, for the censured one would probably open wide his eyes and inquire, "why not"?

In September 1907, the head of the Moravian Mission at Killinik, Labrador, applied in a letter to the commander of the Canadian Government ship "Arctic" to assist them in the matter of an Eskimo who, in pursuance of an acknowledged native custom, had taken unto himself two wives. The missionary stated that he had endeavoured to pursuade this native to separate again from his second wife and that if nothing were done in the matter, he feared that the other natives in the community might follow his pernicious example.

The commander of the Arctic intervened and compelled the uxorious Eskimo to free his second wife and return her to her parents. Everybody was satisfied, wrote the commander in his report, except the first wife who cried bitterly when she saw the other leaving her.

There are few things that the Eskimos require to learn from the white man, but there are many Christian qualities inherent in the Eskimos that the white man, on his present plane of civilization, might copy and practice with a resultant benefit to the peace and happiness of the world

Eskimos self-sufficient.—"Much nonsense" continues Peary, "has been told by the travellers in remote lands about the Eskimos" regarding as gods the white men who, come to them, but I have never placed much credence in these stories; nor has the conduct nor social amenuties of many of the white men who have visited them, been of a character to inspire god-like veneration and respect. For the white man has too often taken advantage of their remote and necessitous condition to despoil them of their furs and ivory, corrupt their morals and poison their blood with infectious diseases. My own experience has been that the average aborigine is just as content with his own way as we are with ours, just as convinced of his own superior knowledge, and that he adjusts himself with his knowledge in regards to things, in the same way that we do. The Eskimos are not brutes; they are just as human as Caucasians.

Are not cruel.—My own observations of this interesting people have taught me to repose no confidence whatever in the tales of barbaric craft and cruelty which I have heard related of them. On the contrary, taking into consideration their uncivilized state, they must be ranked as a humane people. Moreover they have always been quick to grasp the purposes that I have had in view and to bend their energies towards achieving the ends for which my expeditions have been striving.

Eskimos are humane.—Their humanity, as has been indicated, takes a form that would delight a socialist. They are generous and hospitable in a crude way, almost without exception. As a general rule, good and bad fortunes are shared. The tribe shares in the proceeds of goodluck on the part of the hunters and, as their existence depends on hunting, this accounts in large measure for the preservation of the tribe.

Their jovial disposition. –On the whole, these people are much like children and should be treated as such. They are easily elated, easily discouraged. They delight in playing tricks on each other and on the sailors, are usually good-natured, and when they are sulky there is no profit in being vexed with them. The method which children characterize as "jollying" are best such emergencies. Their mercurial temperament is Nature's provision for carrying them through the long dark night, for if they were morose like the North American Indians, the whole tribe would long ago have lain down and died of discouragement, so rigourous is their lot.

How to manage the Eskimo.—In managing the Eskimos, it is necessary to make a psychological study of them, and to consider their peculiar temperament. They are keenly appreciative of kindness, but like children, they will impose upon a weak or vacillating person. A blending of gentleness and firmness is the only effective method. The fundamental point in all my dealings with them has been always to mean just what I say and to have things done exactely as ordered. I have made it to their interest to do what I want done. For example, the best all-round man on a long sledge journey got more than the others. A record was always kept of the game secured by each Eskimo, and the best hunter got a special prize. Thus I kept them interested in their work. I have made it a point to be firm with them, but to rule them by love and gratitude rather than by fear and threats. An Eskimo, like an Indian, never forgets a broken promise nor a fulfilled one.

Should not be civilized.—Enough has been said to give the reader a general idea of these strange people, that have been so valuable to me in my Arctic work. But I want to say again, at the risk of being misunderstood, that I hope no efforts will ever be made to civilize them. Such efforts, if successful, will destroy their primitive communism, which is necessary to preserve their existance. Once give them an idea of real-estate interest and personnal property rights in houses and food, and they might become as selfish as civilized beings; whereas now any game larger than a seal is the common property of the tribe and no man starves while his neighbours are gorging themselves. If a man has two sets of hunting implements, he gives one of them to the man who has none. It is of this feeling of good fellowship which alone preserves a race. I have tought them some of the fundamental principles of sanitation and the care of themselves, the treatement of simple diseases, of wounds and other accidents; but there I think their civilization should stop. This opinion is not based on theory or prejudice, but on eighteen years of intimate study and experience.

Eskimo dwellings.—During the winter, whenever possible these patient and cheerful children of the North live in igloos, or huts built of stones and earth. It is only when they are travelling as sometimes during the moonlit period of the month that they live in the snow igloos, which three good Eskimos can built in an hour or two. In the summer they live in the tupiks, or skin tents. The stone houses are permanent, and a good one will last perhaps one hundred years, with a little repairing of the roof in summer. Igloos are found in groops or villages at intervals along the coasts. As the people are nomadie, these permanent dwellings belong to the tribe and not to individuals, constituting thus a crude sort of arctic socialism. One year all the houses in the settlement may be occupied, the next year none or only one or two.

These houses are about 6 feet high by eight to ten feet wide, by ten to twelve feet long and one may be constructed in a month. An excavation is made in the earth which forms the floor of the house; then the walls are built up solidly with stones chinked with moss; long, flat stones are laid across the top of the walls; this roof is covered with earth, and the whole house is banked with snow. The constuction of the arched roof is on the plan which engineers know as the cantilever, and not that of the Roman arch. The long flat stones which form the roof are weighted and counter-weighted at the outer ends, and in all my arctic experiences I have never known the stone roof of an igloo to fall upon the inmates. There is no doors in the side but a hole in the floor at the entrance leads to a tunnel, sometimes ten, sometimes fifteen, or even twenty five feet in lenght, through which the tenants crawl into their home. There is always a small window in front of the igloo. The window space is not glazed, of course, but is covered with the thin intestinal menbrane of seals, skilfully seamed together. To a traveller across the dark and snowy winter waste, the yellow light from the interior lamp is visible, sometimes, a long distance away.

Bed Plateform.—At the farther end of the igloo, is the bed platform about a foot and a half above the earthen floor. Usually this plateform is not built, but is the naturel level of the earth, the standing place being dug before it, in some houses, however, the bed platform is made of long, flat stones raised upon stone supports. When the Eskimos are ready to move into the stone houses in the fall, they cover the bed platform with grass, which they bring in by the sledge-load; the grass is then covered with sealskins, above these are spread deerskin, or musk-ox skins, which form the mattress. Deerskins are used for blankets. When retiring for the night, the Eskimos remove all their clothes and crawl in between the deerskins.

Eskimo Lamps.—The lamp which stands on a large stone at the front of the bedplatform on one side, is kept burning all the time, whether the familly is asleep or awake. An imaginative person might liken this lamp to an ever-burning sacred flame upon the stone alter of the Eskimo home. It serves also as a stove for heating and cooking, and makes the igloo so warm that the inhabitants wear little heads towards the lamp, so the woman may reach out and tend it.—Oil is the only fuel for heat, light and cooking. The Eskimo women trim the lamps so well that there is no smoke from them, unless there is a draught in the tent or igloo. They cut small pieces of blubber, which they lay on moss and ignite and the heat from the moss tries out the oil, making a surprisingly hot flame. Until I gave them matches, they had only the primitive means of ignition by flint and steel, which they obtained from a vein of pyrites. When I first went up there all their lamps and rectangular pots were made of soapstone, two or three veins of which are found in that country.

Their ability to utilise the soapstone and pyrites is an illustration of their intelligence and ingenuity.

Temperature in igloo.—On the other side of the house food is generally stored. When two families occupy one igloo, there may be a second lamp on the other side; and in that case the food must be stored under the bed. The temperatures of these houses varies from 80 to 90 degrees Farrenheit, on the bed platform and near the roof, to someting below freezing point at the floor level. There is a little air-hole in the center of the roof, but in the happy home of an Eskimo family, in winter the atmosphere could be handled with a shovel.

Welcome shelter.—Often, in winter travelling, I have been obliged to sleep in one of these inhospitable igloos. It is not well for an Arctic explorer to be too fastidious. A night in one of these igloos, with the familiy at home, is an offense to every civilized sense, especially that of smell; but there are times when a man, after a long sledge journey in the terrible cold and wind, hungry and footsore, will welcome the dim light shining through the translucent window of an igloo, as one welcomes the light of home. It means warmth and comfort, supper and blessed sleep.

Eskimos do not wash.—There is no blinking the fact that my Eskimo friends are very dirty. When I have them on the ship with me they make heroic efforts to wash themselves occasionally; but in their own homes they practically never do, and in winter they have no water except from melted snow. On rare occasions, when the dirt gets too thick for comfort, they may remove the outer layer with a little oil.

The skin tent.—With the coming of summer, the stone and earth houses become damp, dark holes, and the roofs are taken off to dry and ventillate the evil-smelling interior. The family then moves outside and sets up the tupik, or skin tent, which is their home from about the first of June till some time in September.

Continue the march.—March 11th.—The day was fine and cold with a light north wind We made an early start and travelled over ground that was as flat as the ice on the sound. The sledge and dogs kept breaking through the thin snow crust and we were kept busy tugging and hauling on the sleds and traces. Just before reaching camp, I saw through the telescope a large herd of caribou about two miles away to the west, in the direction of Zig-zag Lake. I pitched camp with the object of hunting them and obtaining some much needed meat.

Caribou hunting.—March 12th.—We made an early start after the deer we had seen the day before, as they were timid and easily frightened, and in order to make as little noise as possible we stepped on the boulders and the flat stones that were scattered about. We had to crouch down with the rifle with one hand using the other as an extra foot. We could not get nearer than 400 or 500 yards and I was glad to have my hard-hiting 280 Ross with its flat trajectory.

The Ross rifle.—I killed 8 medium-sized young does that were about two years old. I missed the first shot as the deer heard one of the Eskimos walking on the snow and bounded away just as I fired. I wounded the animal which although it bled a good deal, escaped. I then shot 8 of the heard as it was on the run at about 500 yards range. The Ross Copper-tubed bullets, which made a terrible wound, dropped them all. The Eskimos did not hit one and the caribou were soon out of the range of their rifles. Coggan shot away 12 Martini-Henry cartridges and Takkowah fired seven British 303 cartridges from an old single-shot rifle that he had got from the Scotch whalers.

I could have got more deer but wanted to skin and cut up the eight that were shot before they froze. There must have been over one hundred deer in this herd and I could see other deer scattered all over the country in twos and threes.

We skinned and cut up the deer, reserving the backs and shoulders for our own use and giving the rest to the dogs. All the deers were in very poor condition, having no fat at all, and I ate the meat with great repugnance as the flesh on their loins, between the skin and the meat, where the fat accumulates in summer, was one mass of crawling, big, white fat maggots, as thick as one's finger and about an inch and a quarter in length. These maggots were clustered in a solid mass all across the back and loins of the deer, and the Eskimo children would eagerly seize them in their fingers and devour them raw with apparent relish. These maggots occur in the fatty cells of the deer in the winter. In the summer the maggots disappear and are replaced by fat. I have eaten deer meat killed in the summer time which had fat three inches thick over the loins.

The Arctic Caribou.—The Barren Ground or Arctic Caribou correspond to the Rein-deer of Norway, Lapland and Siberia. These fine animals are found in all the Arctic Islands and in the huge hinterland that lies between the west coast of Hudson Bay and the Mackenzie River, and north of the sixtieth parallel of latitude. They collect in immense herds in Baffin Land, in Labrador near the Western Shores of Hudson Bay and in the mainland interior. Herds containing as many as 700,000 caribous have been seen to the east of the Mackenzie River. They are very numerous on Melville island and Banks Land. Peary and other explorers killed many caribou as far as north as Lat.

1—A troop of Arctic Reindeer
2—The Walrus.

3—The Arctic Blue Fox.
4—A Polar Bear swimming.

Igloolik Eskimos

82° N. in Ellesmere and Grant Land and on the Greenland coast.

The Caribou pelt.—The winter coat is quite white and the hair is long and very brittle; this coat is shed during the months of May and June, but it is not until the first of September that the summer coat is fully developed which is the month that the Eskimos hunt them most for their supply of winter clothing When the white fur is first shed, a dark sepia coloured soft, short hair is revealed. This first occurs on the back, thighs and head of the animal. The fur about the eyes darkens and the eyelashs lenghten, which gives the eyes of the animal a very soft and cow-like appearence. When in the velvet, the antlers are covered with a soft light-chocolate-coloured fur and are themselves very flexible and tender. The males in the summer frequent the coast, and are particularly curious and sluggish in their habits, whilst the females, which at this time remain farther inland, are very wild and fidgety. The summer coat when in its prime varies much in its colour, often assuming the richest of amber and cinnamon shades. In summer they graze in the lowlands and valleys which are covered with Arctic herbage, in the autumn they visit the sea-coasts where they feed on the moss, which the fierce winds sweep bare of snow. Only about five per cent of the herds, according to Buxton, consist of males, the remainder being females and fawns. They always live in troops, and to find an isolated caribou is rare. The mating season is September when the males engage in violent combats, which last for several hours and when their enormous antlers become enlaced. The female has only one fawn at a time, in the month of May. She is very fond of her fawn which is a very graceful and dainty little creature, over which she watches with the greatest care and tenderness. The wolves are their greatest enemy. The male loses its antlers in December and the female loses hers in the spring.

Wary and hard to Kill.—The caribou gather into large herds in the spring and Fall. They imigrate northwards in the spring and summer to escape the flies and mosquitoes. In the Fall they migrate south in the direction of the setting sun. Obalski states that the caribou of a certain region have the habit of visiting annually certain spots, known as "the caribou cemetery" where they cast their antlers.

Their chase is very difficult in the winter time, owing to the barren and desolate regions which they frequent. Their sense of smell, sight and hearing are extraordinarily keen and they are always on the alert. They are timid, distrustful, curious and even tricky. They have great endurance and are very rapid in their movements, moving faster than the fastest horse.

The moment the caribous perceive or scents danger, they will disappear out of rifle-range in the midst of the snow-clad hills with the rapidity of lightning. Once in full flight it is useless to follow them. Over freshly fallen snow they will out-distance the fastest dogs, owing to their large feet. When crossing marshy ground their feet spread out and prevent them from being bogged in the treacherous swamps. They are strong swimmers and can remain in the water a long time. When in panic the herd will negociate at top speed all obstacles that come in their path. They have a long springy gait which develops into a fast precipitous trot when they are alarmed. When in flight the joints and tendons of their legs give out a peculiar cracklink noise, like that produced by an electric spark.

Eskimo Caribou call.—They are killed most easily in the months of March and April, when the crust is too thin to support their weight and when at each step their feet sink through into the deep snow, which enables a hunter with his dogs and sledge to come up within close range. When hunting caribou the Eskimos will often, as the animal begin to move off leisurely give forth a peculiar hissing call, like the spitting of a cat, only more lingering, which will cause the deer to halt suddenly, swing round, and face them, thus giving the hunter a good chance to bring them down with rifle or bow and arrow. This magic call is handed down by the Eskimos, from father to son, through generation after generation.

Different species.—There are four species of caribou in North America; The Arctic or Barren Ground Caribou, the Greenland Caribou, the Newfoundland Caribou and the Wood Caribou that inhabits the forests of the more southern regions.

Weight of caribou.—An adult male caribou, when full-grouwn and fat, will weigh from 250 to 300 lbs. The female will weigh about 175 lbs.

European Reindeer.—The European Reindeer is domesticated in Norway, Lapland, the country of the Samoyeds and in Northern Siberia. Since their introduction into Iceland in 1870 and into Alaska in 1892, where they thrive readily, the European reindeer have rendered valuable service. The American Reindeer does not seem capable of being domesticated, altho no great efforts, apparetnly, have been made to prove or disprove this assertion.

The value of Reindeer.—In Europe and Siberia the reindeer are at once the pride, the provider and the wealth of its owner. In life they are most useful beasts of burden and provide milk for the household; when dead, all parts of their bodies are utilized, both by the Lapps and Samoyeds of Europe and the Indians and Eskimos of America. From the horns and bones are made bows and arrows, fishing hooks and spears; the hide is tanned and used for tents and boots; the sinews serve as thread; the fur provides clothing and bedding; the flesh is good to eat and provides food. Clothed in their reindeer skins, the inhabitants can live in huts made of snow and defy the terrible cold of these regions.

Introduction into Alaska.—In 1891 the question of the introduction of reindeer into Alaska was raised by Dr Sheldon Jackson The Eskimos were threatened of extinction from want of food. White men had driven away or destroyed the game, and had depleted the salmon fishery by netting the rivers. It was found that the natives of Eastern Siberia derived their subsistance chiefly from the reindeer, even to a greater extent than do the Lapps. It was, therefore, recommended that the reindeer should be introduced for the use of the Alaskan Eskimos. Congress having refused to grant an appropriation for the purpose in 1891, $2,146.00 were raised by private subscription for the purchase of reindeer. With this sum 187 deer were brought from Siberia, with regular herdsmen, to whom a certain number of Alaskan Eskimos were apprenticed as herdsmen and teamsters. From 1892 to 1904, 1280 deer were imported from Eastern Siberia to Alaska, and in 1904 the whole total number of fawns was 10,267. In the Official report of the Commissioner for Education, published 1905, it is stated; "It is perfectly safe to predict from the inspection of the animal per cent of increase, the doubling of the herd every three years". All the female deer are preserved The males are used as food or trained to harness. Allotements of 50 deer are made to those natives who underwent apprenticeship. Seven Lapp families, on account of being more civilized than Siberians, were in 1894, employed to take charge of the Siberian deer in Alaska, and to teach the Eskimos. From December, 1899, to May 31st, 1900, the United States ran a mail by reindeer under contract, three round trips from St-Michael at about 63° 30′ N., across the Seward Peninsula to Kotzebue, which is outside the Arctic Circle about 66° 59′ N. Each round trip of 1,240 miles was succesfully accomplished through an unbroken wilderness without a road or trail. Several relief expeditions to the far-north have been succesfully carried out by United States Officers in Alaska by means of reindeer, when such expeditions would have been impossible by other means. A contract has lately been entered into to carry a regular winter mail over the 650 miles from Zotzebue to Cape Barrow, the most northerly point of Alaska, about 71° 20′ N. It is said that on these journeys "when used in relays 50 miles apart, reindeer can transport the mails at a rate of 200 miles a day".

Importation.—In 1898 the United States Government imported from Lapland 538 head of choice reindeer trained to harness, 418 sleds and 411 sets of harness, a few herding dogs and 50 drivers some of whom had families, making in all 113 immigrants. These Lapland deer were not for breeding purposes, but only for harness. More than half of them died of starvation after reaching Alaska, as no moss had been provided for them. From 1894 to 1903 Congress has appropriated no less than $158,000.00 for the introduction into Alaska of domestic reindeer from Siberia. It has been found that "with careful training the Eskimos make excellents herders". It is thought that in 35 years there may be 35,000,000 reindeer in Alaska, with a large export of carcasses and skins every year. The deer purchased in Siberia from the Chunches cost $4.00 a head, from the Tunguse $7.50 a head.

Only a single species.—It is stated by Mr Gilbert H. Grosvenor that "the tame reindeer from Siberia is practically the same animal as the wild caribou of Alaska, changed by being domesticated for centuries". This corresponds with the general view of English Zoologists, that there is but a single species of reindeer, but presenting local peculiarities. It appears that the Alaska deer is not equal to the Lapland deer in strength or speed. A pair of the latter can pull a load of 500 to 700 lbs at the rate of 35 miles a day, and keep this up for weeks at a time. Mr Armstrong states that a single deer can draw 600 lbs, on a sled 30, 50 and even 90 miles a day. It is said the Lapland deer can in point of speed do 150 to 200 miles a day, and sometimes 20 to 25 miles down hill in one hour. The Alaska reindeer express has been driven at a rate of 95 miles a day. Reindeer can travel as well at night as in the day time. In Siberia a caravan of 160 sleds is managed by ten men. In summer a reindeer can carry as a fair load, a pack of 150 lbs. A good deer can easily carry a fair sized man. The reindeer cow gives about one teacupful of very rich milk, nearly as thick as the best cream which makes delicious cheese.

Should acclimatize readily in America.—There is now no doubt that the Lapland or Siberian reindeer would thrive over all the barren-lands of Canada, the Mackenzie country, the Arctic Islands and in Labrador and Newfoundland; as both climate and food are suitable. It would be an easy matter for natives or residents of those regions, who are accustomed to handle dog sleighs, to learn to handle reindeer, in the same way that the residents of Australia have learnt to handle camels for purposes of transport over their barren, waterless interior.

Would be a great value.—American experience would seem to leave the question open as to whether reindeer should be best imported from Siberia, from the Tunguse or from Lapland. They might not be procurable, at least for many years, from Alaska. But it seems clear that the teachers should be Laps. The Americans found that the dear stand a journey remarkably well. Immense herds could be run all over Labrador, Baffin Land and the Mackenzie country, enough to supply the population with food, to provide them with a means of travel, and to furnish a valuable export of meat and skins. Reindeer post communications would be of inestimable service to those remote regions.

Threatened with Extinction.—A despatch dated February 9th, 1914 from Christiania, Norway, gives the information that Mr Staaf, Government Inspector of Lapland, has reported that the usuful race of Lapland reindeer is on the point of extinction owing to a change in the mode of living of the Laplanders. The natives are abandoning their nomadic life of moving from one place to another accompanied by their reindeer, and are establishing themselves in fixed settlements on the river-banks and devoting themselves to fishing. In 1912 there were in Lapland 29,346 reindeer; to day there are not more than 25,761. Mr Staaf is urging the Norwagian Government to take special means to encourage the raising of reindeer.

Cold weather.—After giving the dogs a good feast of the caribou meat, we drew the balance on the sled back to camp, which we reached in the dark, completely tired out and hungry, but happy in the knowledge that our larder was replenished. The sun sank below the horizon about 6 o'clock in the evening, and the thermometer at salmon River registered 49° below zero. Rather cold weather for hunting; but our lives depended on it.

March, 13.—We started early and made a good days march. The sun was shining bright and there was scarcely any breeze. The breath from our lungs ascended straight in the air, at least, so much of it as did not condense and freeze on our bards and moustaches.

A large Caribou herd.—About 9 a. m. I sighted a very large herd of caribou on my right to the east and very nearly abreast of us. The herd was about 3 miles away nd two miles long. Through the telescope I could distinguish a the individuals of the herd scraping the snow with their feet and eating the stunted grass. Some were lying down asleep; others were walking about slowly, and others were grazing, A dence cloud of vapour rose in the still cold air from their condensed respiration.

The valley narrows.—In the afternoon we reached a small hill that rose like a miniature island, out of the plain at the narrowset part of the long valley. Here the hills on either side approach to within half a mile. I called a halt to give the tired dogs a rest, as the going was very heavy over the rotten, thin-crusted snow

The hills on our eastern flank were composed of dark-brown, rusty looking rocks which enclosed a well formed quartz vein, very well defined, about 4 feet wide, and running right up the hill, east and west. Numerous small quartz stringers ran into it. The quartz, some of which I broke away, was full of black, gray and blue spots, but contained no mineral. Adhering to it was a dark dirty looking greenish clay similar to what is known as "slickensides" in Porcupine. As we resumed our march I walked along the base of these hills for over an hour and noticed that similar veins of quartz were everywhere apparent. I brought back with me some of these quartz samples.

A cold night.—When darkness fell we had trouble in finding snow compact enough with which to built an igloo. To add to our discomfort a north wind sprang up which cut our faces like a knife, the long narrow valley between the lines of hills acting as a funnel, and increasing the wind's intensity. We passed a very cold night.

Caribou valley.—The valley which I have named the caribou valley, was evidently at one time under water and a connecting waterway between Admiralty Sound and Roald Sound and Fox Channel. The rock on each side of the valley are scarred, rubbed and polished as if by glacial ice-floes and bergs. The valley which is flat and level and very little above the level of the sea, has evidently been pushed up by some volcanic or seismic upheaval. Brodeur Peninsula was formerly an island, or probably two islands, as the few miles of low land which separate Bernier Bay from West Bay, have apparently been the result of a similar upheaval. Perhaps also the southern portion of Brodeur Peninsula was subdivided by a similar upheaval of the land between South Bay and Aggo Bay, along the route of Long and Ibbisauktoo Lakes.

Intensely cold.—March 14th.—We made another good day's march. The sun was often obscured with clouds and the freezing northwest wind nearly cut us in two. We dared not stop to rest the dogs for fear of freezing to death. The thermometer that day at Salmon River registered 44° degree below zero, but where we were I believe it was over 50° below.

Hunting Caribou.—Seeing some caribou about two miles away on the hills, with the aid of the telescope, Coggan and I started after them. We saw plenty of deer around us. As we approached them, one of the old dogs, that was tired, began to howl and frightened them and the deer fled out of range. We chased them for nearly a mile but the wind was blowing too strong to risk a long shot, and we had no cartridges to waste. We tried to get closer to them, hopping from stone to stone, in order to make no noise on the crust, but to no purpose. After spending four hours chasing them over the hills, first dripping wet from perspiration owing to our exertions in running and then freezing in the bitter wind, we overtooke the rest of the party who had pitched camp at the N. W. of a long lake. They had only just cut the snow-blocks for the igloo when we arrived and we helped to build it. When finished I crawled in thoroughly fagged out and hungry, and after a scanty meal of raw caribou and melted snow, struggled into my frozen sleeping bag, where I dosed and shivered all night.

Flat Lake.—The valley throughout its length was flat and level, so level indeed that we only knew we had come on the lake by the firm feeling of the snow-covered ice underfoot instead of the softer and more yielding moss and turf on the land. The hills each side consisted of black-brown rocks that were fissured everywhere by perpendicular cracks. The lake which I christened "Flat Lake" runs about N. W. and S. E., is about ten miles long and from one to three miles wide. In the center the lake narrows to half a mile wide; the northern end being very shallow and covered with small rocky knolls and inlets. The southern half is deeper and free from these knolls. The Eskimos told me that the lake teems with salmon.

Caribou hunting.—March 15th.—We remained all day at Flat Lake Camp in order to hunt caribou, as we had no meat for the dogs. The day was bitterly cold with a strong N. W. wind blowing. Accompanied by Coggan and Takkowah, I went after caribou and when we had travelled into the hills on the west side some ten miles from the camp, we managed at night to kill ten small deer, after walking hard after them all day. Of these Coggan killed one, Tokkowah spent three cartridges on his two deer and I bagged the rest, spending a single cartridge for each deer. We skinned and cut up the deer where they fell and, after giving the tired and famished dogs a meal, returned to camp. We cached the meat and skins to be picked up the next day as we passed. We reached camp in the dark, very tired, cold and hungry as usual. During all these days we ate only twice a day and were thirsty all the time and in consequence I ate or drank a great amount of snow. That night I thought we should all freeze in the igloo.

Two wolves.—March 16th.—I sent Takkowak after the deer-meat that we had cached, and made a good day's march. Shortly after starting from camp, Peewiktoo shot at and badly wounded two wolves at long range with my 280 Ross. These wolves had stopped to gaze at us about a quarter of a mile away. We saw copious marks of blood which they left on the snow as they loped away.

Almost frozen to death.—When Takkowah overtook us, we halted and built an igloo I nearly froze my hand and one foot in the process. So numbed was I in all my limbs that I thought at any moment they would become frozen. Peewiktoo had to help me into my sleeping bag as it was frozen stiff and I crawled into it by degress as the heat of my legs and body gradually thawed it out. We camped on the ice at the southern extremiêy of Flat Lake, close to where the river flows from it into Roald Sound. This river appears on existing maps as the Giffard River.

Stores run out.—March 17th., St-Patrick's Day.—We started early in morning to make a big day's march, as our supply of frozen seal blubber for the Eskimo stove was running short, and I was anxious to reach Igloolik as soon as possible.

We had long ago finished our supply of seal meat and our only food supply was the poor, frozen flesh of the caribou that we had shot.

We followed the course of the Giffard River which consisted of a continuous series of small chutes or rapids running in ziz-zag fashion, until we reached the head of what I named Roald Sound in honnor of that intrepid Arctic and Antartic explorer, Roald Amundsen.—The Gifford river is only about three miles long and thirty-five yards wide; but it must contain a large volume of water in the spring, as several small streams and rivulets flow into it from both sides. The largest of these streams enters it from the east side, about 500 yards from where the river leaves the lake.

Lieut. Hoppner of the Fury visited Gifford Inlet in June 1823. His account reads as follows:—"I walked up the inlet and after passing the two first points of land, made towards a high mount on the south side, about 12 or 14 miles distant from the entrance, hoping from thence to see the termination of the inlet, which here varied from one to three miles in breadth. At 5 p. m. finding the above mentioned hill still too distant for me to reach on foot, I landed on the right hand shore from whence the opening appeared to extend at least a day's journey for the sledge, continuing about the same breadth and not appearing to terminate even at the furthest point seen". Returning to camp, Lieut. Hoppner on the following day, June 25th started again up the inlet. "The Esquimos told us we might reach the head of the inlet to day, we therefore resumed our journey. At 4 p. m. having reached two small inlets situated nearly in mid-channel, we stopped for half an hour to refresh ourselves and again set off at a quick pace. The weather was so thick it was but rarely we got a glimpse of the shores on each side of us; when we did they appeared rocky and steep; but a short distance from the beach the land appeared well-clothed with vegetation. As we advanced the ice became very thin and rotten, and gave indication of our approach to its termination; at length we found ourselves within fifty yards of the water, and were obliged to pick our way to the shore over very rotten ice. On landing we were gratified by the sight of a noble sheet of water, one mile and a half in breadth and perfectly fresh. The tide was out, but there was no current perceptible in the middle, nor did we notice any during the whole time of our stay. The Esquimaux had informed us of a large fall, but as we neither saw nor heard anything of it, it must be a good way higher up, our point of view extending full fifteen miles, when it terminated in two bluff points, between which the stream seemed to wind. To these points, to all appearance, it continued about the same breadth and from the colour of the water it must be deep enough for ships of large burden. The land on each side was high, and where we stood was more closely covered with vegetation than any spot I had ever seen in these regions. The dwarf willows grew to a height and size almost entitling it to be called a shrub, and the Andromeda tetragona was in the greatest abundance."

Parry also mentions the Giffard river as having tremendous force in July and that at the entrance of Roald inlet was a high wall of ice-blocks that extended from land to land and which had been thrown up the surface of the ice by the force of the current. "The force employed for this purpose may be conceived when I mention that of several of ice-blocks, one in particular was above eight feet thick, fully forty yards in circumference and lay more than five hundred yards from the open pool from which it must have been thrown up."

The country, through which the Giffard River runs, consists of low, round and almost flat hills. As I started down the frozen riverbed, jumping from one ice-covered stone to another, I slipped and one leg fell through the thin ice-crust on the rocks beneath. I nearly broke my right knee-cap and the pain made me sick. So painful was the bruise that I could hardly limp along behind the sledge, and could not put my whole weight on that foot, nor straighten the leg for three or four days afterwards. During the following three or four days, until we reached Igloolik, I had to ride part of the time on the sled and, between the pain of the bruise and the intense cold through not being able to run beside the sled, I suffered a great deal, but I had burnt my bridges, and a case of reach Igloolik or perish of cold and starvation.

Painful progress.—We camped about seven miles from the head of Roald Sound, in a small bay on the north shore. I had great difficulty in getting into my sleeping bag with my crippled knee and I was completely fagged out with the efforts I had made to hobble along behind the sledge and help the dogs with the load. The pain kept me awake all night although I nearly fell asleep, so tired was I' when eating my supper of raw frozen caribou, and could not write up my diary. I would dose off when an extra throb from my wounded knee would wake me up again.

Roald Sound.—Roald Sound. which appears in Low's map as the Giffard River, is a fine sound about 25 miles long and 3 miles wide at the upper end, and 5 miles wide at the mouth. It is bordered on either side by low sloping hills of black and gray rock which gradually run lower towards the mouth.

A plainful day.—March 19th.—Starting early, we proceeded steadily down the sound. The day was intenslly cold but with scarcely any wind. I suffered agony from my bruised knee and was very tired when we reached camp that night, as part of the day I hobbled painfully along behind the sledge. We built an igloo in a small bay on the south side of the sound about five miles from the entrance. We had no fire to warm the igloo, as our oil was finished and the night was intensely cold at least 45° below zero. After a scanty supper of raw caribou and snow, I tumbled into the frozen sleeping bag and, with my aching knee to keep me from sleeping passed a truly wretched night.

The last lap.—March 19th.—We started early on our last lap for Igloolik. I left Coggan on the point at the southern side of the entrance to the sound to hunt for caribou and then follow us to Igloolik. We marched all that day all night and half the next day without stopping and we ate nothing for nearly two days. We stumbled along in the dark in a dogged, spiritless fashion, just walking, tugging at the sleds and falling over the rough, rafted ice that had been piled up by the continual conflit of currents from Fury & Hecla Strait and Fox Channel. I suffered, as may be imagined, agonies from my bruised knee, especially when stumbling over unseen ice-cakes that would rise up and hit me in the dark. The dogs were faint with hunger and fatigue and could hardly muster up enough strength to pull the load. The Eskimo men and women, were half stupid with cold hunger, thirst, fatigue and want of sleep. I often thought that my feet would freeze as my socks were all the time wet with perspiration and I had no opportunity of drying them in the igloo having no oil for the stove.

For the rest of my days I shall recall with a shudder the pain and prolonged misery of that last 36 hours hike into Igloolik.

When we struck the rough ice north of Igloolik, we were compelled to throw off the fox-traps and other baggage on to the ice as the dogs could not pull them any further. The day of the 19th was most terribly cold and a strong freezing wind blew from the north-east. The thermometer at Salmon River registered on that day 48° below zero. That night as we stumbled along in the dark over the rough ice, I nearly froze my face, hands and feet, due to wet mitts and socks. To make matters worse we struck the rough ice at the darkest hour of night, and we fell, slipped, stumbled and floundered along, often losing our direction and were at last obliged to lighten the loads in order to make any headway at all.

Reach Igloolik.—March 20th.—When the morning broke, I saw the low-lying land of Igloolik island ahead of me. The island is so flat that I could only distinguish it from the surrounding ice that covers the water of Fox Channel by the high-piled masses of rafted shore-ice, twenty and 30 feet high, that fringed the shore.

We struggle in to the native village, at the south-eastern extremity of the island, about noon, and standing on the shore I saw four Eskimos, who comprised the whole of the male population, as most of the Igloolik natives had gone to Ponds Inlet and two had travelled south to trade with Captain Comer at Aiwillig, near Wager Inlet.

Astonishment of natives.—These natives were very astonished when they saw me as I was the first white men to visite Igloolik since Sir W. E. Parry, the pioneer and champion explorer of the British Navy, had wintered there, with his historic ships the Fury & Hecla in 1822-23, ninety years before. Some of these natives had never seen a white man before and held them in fear. They had heard of Parry and his men only through tradition.

Complete Exhaustion.—That night we were all too worn out with fatigue, hunger and want of sleep to build and igloo, and, after constructing a small snow hut in which to store the things and harness to protect them from the starving dogs that were as hungry and ravenous as wolves, we all crowed into Eetootarjoo's igloo, and after a supper of some tough, putrid, frozen walrus which smelt abominably and tasted worse, I fell asleep with my head on my knees. I could not get into my sleeping bag as it was frozen and had shrunken to half its size. I was like a drunken man through want of sleep hunger, cold and sheer physical exhaustion.

Peewiktoo and his poor, plucky little wife, Tootillik were in the same condition. They simply fell forward, head on knees, and slept. All three of us sat huddled together, back to back, for mutual support and slept. But even then we were not allowed to slumber indisturbed, as the curious and wondering natives from the other igloo kept crowling into our igloo to feast their eyes on the strange white man who had so unexpectedly stumbled into their midst from the far north in the depth of winter. They would persist in talking and putting questions to us which we were too exhausted to answer. Our only response was a grunt and a snore. All that we wanted was to be left alone and to forget our misery in sleep. My soreknee too had been badly bruised again when stumbling over the bad ice and caused me much pain and also interfered with my repose.

CHAPTER VII

IGLOOLIK—AURORA BOREALIS—PARRY'S VOYAGE

Drying Clothes.—We slept late, on March 21st, the day after our arrival at Igloolik, as we were all worn out with fatigue and want of sleep. My first occupation was to dry my sleeping bag, wet mitts and socks, my whole suply of the latter being damp as I had no opportunity of drying them on the march. The usual winter foot gear in the Arctic is a pair of long tooktoo (caribou), or young seal socks that reach to the knee, with the hair lining inside, a small overshoe of tooktoo or sealskin which fits over the foot to protect the sole of the foot from the intense frosty cold that beats up from the ice, and an outer shoe, made of big seal (oogjook) or bearskin with legs of caribou skin with the hair outside, or made of the untanned skin of the polar bear. This is the warmest and softest form of foot clothing imaginable, in the ordinary footgear of civilization the feet would become frozen instantly. In the Arctic one's feet are constaintly perspiring in the Eskimo airtight shoes and unless the wet socks are changed and dried when camp is reached, they are very liable to freeze. The same thing applies to the gloves, of which two pairs are worn; an outer pair of deer, seal or bearskin, with the hair outside, and an inner pair of deerskin, with the hair inside. When the oil supply is low and the tent or igloo contains several people all anxious to dry their wet socks and mitts over the feeble flame at the same time it is a discouraging process. The other mode of keeping the blood warm and in active circulation is to keep constantly moving about. When walking and running alongside the sleds during the daytime one often gets over-heated; but when the day's journey is done the reaction sets in, and the misery of handling the wet snow blocks when building the igloo and of standing about in the biting north-winds, with the temperature 40° to 50° below zero, is often almost unendurable, especially when one's blood is thin from want of nourishment.

Unpleasant diet.—We breakfasted that day on raw putrid walrus which smelt and tasted worse than rotten onions; but it was either that or starve. My hands and beard were saturated with its foul-smalling grease. We passed the night in Eetootarjoo's igloo, as we could not master up sufficient energy to build a snow igloo for ourselves in the freezing wind that was blowing from the north. The cold intensity of the winter winds in the Far North is hard for any one living in the more temperate zones to imagine.

The Arctic winds.—The northerly winds sweep down from off the glacial expanse of the Polar Ocean, accompanied by gusts of whirling, blinding snow-clouds, with such force and bitiug face-freezing intensity that the traveller is forced to hurriedly build a snow igloo or take refuge in a snow-drift until the fury of the storm is spent. Sometimes the wind will start to blow from the N. W., and then gradually increasing in strength, will swing to the W. and S. W. and sweeping over the landscape will bury every thing in snow, several feet deep. During the height of the storm, travel is impossible—the trail is wiped out, the landscape is obscured, lamps and lanterns are invisible at a distance of a few yards away and the unfortunate being who finds himself outside and exposed to its fury, is forced to crawl on hands and knees to avoid being blown bodily away. But the strongest gales often come from the S. E. and are terrific in their force and destructiveness. At Ponds Inlet last Christmas, a huge unweildy Newfoundland boat, over thirty feet in length and built of heavy solid timber, was picked up by the furious blasts of a south-easter and carried bodily a distance of 50 yards, demolishing in transit an igloo built of heavy snow blocks, which, fortunately, the family had left the night before. At Melville Island a wind velocity of 100 miles an hour was once recorded, and gales from 70, 80 and 90 miles an hour were not unfrequent during the months of February, March and April. These gales often last three days at a time and during the height of the storm the temperature will rise from 40° to 50° below zero. The hill sides are swept bare of snow which packed deep and solid into all the ravines, valleys and depressions.

Another bad night.—That night, having no sleeping bag, I slept with only my coat to cover me, and as the temperature was about 50– below, I spent a restless and shivering night, which was agraved by the pain of my wounded knee.

Go after walrus.—March 22d.—Taking with me, Takkowah and the Igloolik native, Awah, I went after walrus, as we had no oil for our fire and the dogs had not eaten for three days. We, too, were completely out of deer meat and our only sustenance was that furnished by the rotten, old, stinking walrus meat that we had got from Eetootarjoo. I left Peewiktoo behind to build an igloo, as Coggan was expected to turn up at any moment with a fresh supply of caribou meat.

Dangerous ice.—We took a team of dogs and a sled to reach the walrus hunting ground on the edge of the ice-fringe about three miles east of the islands. As the wind was blowing strong from the S. E. we found that the loose ice-pans that are always floating about in Fox Channel were being driven up on the edge of the solid shore ice. We had to avoid these, as if we had embarked on one of these floating pans, with a sudden change of wind, our position would have become desperate. The pans would be driven away from the shore into the center of the Fox Channel and we should all have perished of cold and hunger. Whole parties of Eskimos have perished in this way while hunting seal and walrus on the unstable edge of the shore ice; as a sudden change of wind would disrupt and break off great pans from the outer ice-fringe driving away from the land out the sea. All the men and the women of the native village near Strathcona Sound were swept away and perished in this fashion, only two old women who had remained in the igloos, being left to tell the tale.

No luck.—We saw a big seal (oojook) asleep on the ice and Awah and I started after him with rifle and harpoon, but the animal awoke and, seeing us, plunged into the sea through a hole in the ice. We saw no walrus and were forced to return to our wretched igloo, cold, tired, hungry and, what was worse, empty handed. We found that Peewiktoo and Tootillik had built the igloo in our absence, and the latter, brave little woman, made a small fire of seal blubber which she had barrowed from another native. For supper we chewed on some of the old rotten walrus which was tough as leather. My sleeping bag was not yet dry and my knee pained me badly. It was terribly cold in the fireless igloo and as Coggan had not yet arrived with a fresh supply of caribou meat, the outlook was depressing in the extreme. We had neither food nor fuel and the Igloolik natives had none to spare, being themselves ill-provided with meat and blubber. The dogs had eaten nothing for nearly four days and between us and the rest of the expedition lay some 400 miles of inhospitable frozen sounds and barren snow-covered hills. Our position was rendered the more precarious through the fact that our cartridge supply was limited, and on our rifles lay the responsability of providing us with food and fuel. But through it all I never lost hope and always held the firm conviction that we should came through in safety.

Igloolik island.—March 23d.—I spent the day in exploring the island of Igloolik. The island resembles in shape the form of a crouching bear with the head towards the east and the tail towards the west. The native village is pitched on a low flat point on the south-eastern extremity of the island, near a small lake, The island which is some eleven miles long and six miles wide from north to south is very low and flat. The beach is covered with limestone pebbles smoothed and rounded by the action of ice and water, and the interior of gravel banks which are covered with stunted scurvy grass (cochlearia fenestrata) and which are not over ten to twenty-five feet above sealevel. So flat is the beach that, when covered with ice in the winter, it is hard to tell where the land begins and the water ends. The heavy ice-pans are everywhee driven up high on the low beach by the force of the wind and tides. The sea is very shallow all round the island. On the eastern end of the island, between the head and fore-paws as it were, is a triangular bay about three miles deep and the same width at the mouth. In the center of the island is a shallow bay that runs into the body of the island in a north westerly direction. This bay is about five miles deep and one mile wide. Near the head of the bay is a small lake which discharges into the bay, and was said by the narives to contain small Arctic salmon.

Sir W. E. Parry.—In 1821, Sir W. E. Parry, who had previously explored Baffin Bay and Lancaster Strait as far as Melville Island, entered Hudson Bay and passing to the north of Southampton Island examined Repulse Bay and wintered at Winter Island, a few miles beyond the eastern entrance of Frozen Strait. Parry was then searching for a north-west passage. His ships "Fury" & "Hecla" were released from the ice on the 28th of June, 1822, and Parry then pushed northward through the heavy ice-floes of Fox Channel along the eastern shore of Melville Peninsula, until stopped by the heavy floes of old Arctic ice of the eastern entrance of Fury and Hecla Strait, where the remainder of that season and the early part of the next (1823) was spent in trying to pass through the strait, the western part of which remained continuously blocked with heavy ice. Exploring parties from Parry's ships made flying sled surveys and soundings along the eastern shores of Melville Peninsula and in the vicinity of Fury and Hecla Strait, but I found that the formation, shape and position of the islands and bays in that neighborhood, as described in the existing maps, were very far from accurate. Parry explored the west side of Fox Channel from Frozen Strait to Fury and Hecla Strait. The results of his observations have been summarized by Dr Dawson as follows:—

Geological formation.—The geological specimens brought back were examined by Professor Jameson and the detailed maps of the expedition include indications of the character of the rock at so many places, as to afford the means of tracing the geological outlines with very considerable accuracy. Granitic and gneissic rocks occupy the whole of the southern part of the east shore of Melville Peninsula, and are continued northward behind a low track of limestone country, forming a range of mountains in the centre of the peninsula to Fury and Hecla Strait. They also form the south shore of this strait, and most of the islands in it, and apparently the whole eastern shore of the adjacent south part of Cockburn "Island".

Rock specimens.—The rocks referred to above, are similar in a general way, to the Archaean, probably including areas of Huronian, Jameson mentions as among the prominent varieties of rocks derived from this region; "Granite, gneiss, mica-slate, clay-slate, chlorite-slate, primitive-trap, serpentine, limestone and porphyry". In a ssociation with these the following minerals occur. "Zircon and beryl, also precious garnet, actinolite, tremolite, diallage, coccolite, rock-crystal, cale-spar, rhomb-spar, asbestos, graphite or black-lead, specular iron-ore, chromic ore, or chromate of iron, titanic iron, common and magnetic iron pyrites". Some of the "transition rocks" noticed by Jameson should probably also be classed with the Archaean, and in addition to several of the minerals above mentioned, in these were found tourmaline (schorl) and molybdenite.

Magnetic Variation.—Igloolik was observed by Parry in 1823 to be in Latitude 69° 20′ 30″ N. and Longitude 81° 52′ 46″W. The Magnetic Variation of the Compass was *82° 21′ 51″ westerly* and the dip of the Magnetic Needle *87° 37′ 09″*

Tide.—The tide at Igloolik rise and falls about 5 feet.

Parry's Observatory.—Parry's observatory, 13x8 feet, was built with a flat instead of a pitched roof, and this as well as the sides were of single planks, lined on the inside with canvas and closely covered with first by turf and then by slabs of snow, Being smaller than previous observatory houses built by Parry there was a great increase in warmth and reduction of labour and materials required in the construction.

The Sun.—The sun disappeared from sight below the southern horizon at Igloolik for seven weeks—November 26th to January 6th. When the sun re-appeared a parhelion appeared on each side of it and exactly opposite to it near the northern horizon was a large circular patch of whiet ligth.

Refraction.—Shortly after the sun's re-appearance, it not unfrequently happened about this time, that a part of the low shore to the southward of Igloolik appeared by the effect of refraction, to be raised and separated, forming a long, narrow streak of dark colour, like a cloud, suspended a few minutes above the land, in a position nearly horizontal.

Winter Temperature.—The average temperature at Igloolik in 1822-23 as determined by Parry for that winter were:—November 19° 37, December 27° 8, January 17° 7, February 20° 4, and March 19° 75; which indicate a mild winter for those regions.

Spring Temperature.—Parry writing of the sudden transition from perpetual darkness to perpetual daylight at Igloolik writes:—"The difference in the temperature of the day and night began to be sensible as early as the first week in March, the daily range of the thermometer increased considerably from that time. The increase in the average temperature of the atmosphere, however, is extremely slow in these regions long after the sun has attained a considerable meridian altitude, but this is in some degree compensated by the inconceivable rapidity with which the days seem to lengthen when once the sun has reappeared. There is indeed no change which continues to excite so much surprise as that from almost constant darkness to constant day; and this is, of course, the more sudden and stricking in proportion to the height of latitude; for soon after the middle of March, only ten weeks after the sun's reappearance above the horizon, a bright twilight appeared at midnight in the northern heavens.

Clouds.—Writing at Igloolik on March 28th, 1823, Parry reports:—"One of the most remarkable circumstances about this winter, which distinguish it from any preceding one we had passed in the ice was frequent occurrence of hard, well-defined clouds, a feature we had hitherto considered as almost unknown in the winter sky of the polar regions. It is not improbable, that these may have in part owed their origin to a large extent of sea open to the south-eastward throughout the winter, though they not only occured with the wind from that quarter but also with the colder weather usually accompanying north-westerly breezes. About the time of the sun's reappearance and for a week or two after it, these clouds both from their novelty and from the glowing richness of the tints with which they were adorned were a constant subject of admiration. It is scarcely possible for nature, in any climate, to produce a sky exhibiting greater splendour and reckness of colouring than we at times experienced in the course of the spring. The edges of the clouds near the sun often presented a fiery or burnished appearance, while the opposite side of the heavens was distinguished by a deep purple about the horizon, gradually softening upwards into a warm yet delicate rose-colour of inconceivable beauty. These phenomena impressed us the more forcibly about the time of sun's permanent setting, and that of his re-appearance-especially the latter. Besides the colouring of the clouds just mentioned, I also observed five or six times, in the course of the spring, those more rare and delicate tints of pale-green, carmine, salmon-pink, mauve, gold and rose-pink that we observed at sunset at Winter island."

Aurora Borealis.—Parry reported:—"On the 26th November 1821, (at Igloolik) both in the morning and evening, the Aurora again appeared from south-east to south-west, the brightest part being about ten degrees above the horizon, and with pencils of rays shooting upwards towards the zenith. In almost every instance it is observable that the light, however irregularly disposed in other respects has a tendency to assume an arc-like form; but I think a plane bisecting the arch would more generally have coincided with the true than the magnetic meridian; in the phenomena we had an opportunity of observing. This was particularly the case in the morning of the 27th when at 6 a. m. the Aurora formed one broad and continous and well-defined arch, its centre passing rather to the southward of the zenith, and its legs appearing to rest upon the horizon at east and west. For several hours on the evening of the 28th, it was seen in the south-east, with rays darting rapidly up nearly as high as the zenith. There is almost always one stationary patch of light near the horizon, appearing, as it were, the source whence the shifting or variable part of the phenomenon proceeds. It will be seen from about this period how much more froquently the Aurora seem to issue from the south-eastern quarter than from any other during the rest of the winter."

In the concluding month (December) of the year 1821 at Winter Island there were more brilliant displays of the Aurora Borealis than we had noticed at an earlier period of the winter. Sirius which was nearly on the meridian at the time, exhibited the most beautiful violet and blue colours that can be imagined. The violet was to the westward which was the direction in which the moon was and the Aurora was playing about at the time—I thought I had never seen anything so brilliant; the play of prismatic colours in a cut diamond comes the nearest to it.

"On the evening of December 3rd, the Aurora appeared in little white spots, resembling the nebulae in the heavens, as viewed in the telescope, or the milky way in a very clear night. I may here remark by the way that this last beautiful feature of the heavens very seldom appeared here, for notwithstanding the notion generally entertained of the extreme clearness of the atmosphere under a Polar sky. We have always found the reverse to be the fact. It is true, indeed, that with the northerly or westerly wind; the sky was generally what would be called clear; but there is scarcely one night in twenty when the heavenly bodies, if viewed through a telescope, do not appear surrounded with more or less haze. Indeed it very seldom happens that a considerable deposition of minute snow may not be observed to take place, evening in the clearest nights in these regions."

Encyclopedia Britannica.—"Aurora Polaris, Aurora Borealis or Australis, Polar Light, Northern Lights or Streamers, an electrical metoor, appearing most frequently in high latitudes in the form of luminous clouds, arches and rays, of which the latter sometimes met at a point near the zenith and form what is called a boreal crown. The arches are sometimes single; sometimes several consecutive ones are seen, and they are usually stationary or move slowly southward. They cross the magnetic meridian at right angles, and therefore in England have their centres nearly N. N. W. The rays rise perpendicularly from the arches, but are sometimes seen detached, or when the arch is below the horizon. They are parallel to the dipping needle, or in other words, to the curves of magnetic force; and the boreal crown, at which they appear to meet, is merely an effect of perspective. The rays are seldom stationary, but appear and disappear suddenly, shooting with great velocity up to the zenith, and moving slowly estward or westward but more commonly the latter. They sometimes cover the whole sky, and frequently have a strong tremendous motion from end to end. This tremendous motion is sometimes seen also in the arches when near the zenith; and Benjamin V. March mentions a case, in which the matter of the arch had the appearance of a rapid torrent flowing from east to west. A rare form of Aurora is that in which the rays appears to hang from the sky like fringes or folds of a mantle. The ordinary colour of the Aurora is a pale greenish-yellow, but crimson, violet and steel-colour are not uncommon. Crimson Auroras have often been imagined by the superstitious to be omens of war, pestilence and famine. They were called by the ancients chasmata, bolides, and trabes according to the form and colours. In Shetland they are very frequent and in the north of Scotland, they are known as the "merry dancers" (perhaps the ancient caprao saltantes); while from a curious passage in Sirr's "Ceylon and the Cingalese" Vol. II, p. 117, it seems that the aurora, or something like it, is occasionally visible in Ceylon, and that the natives call it Buddha lights. Mr Jansen says, however, that the great Aurora of 4th February, 1872 which was seen at Bombay, was not visible in Ceylon. In many parts of Ireland a scarlet aurora is supposed to be a shower of blood, and under this name, is not unfrequently mentioned in the old annals, always in connection with some battle or the murder of a great chief.

Explanation of Aurora.—As the arch of the Aurora is always at right angles to the magnetic meridian the phenomena is assumed to be the result of magnetism. It also affects electrical wires and the magnetic needle; thus in France and elsewhere the Aurora of August 30th and September 1st, 1859 noiselessly worked the telegraph needles and violently rung the alarm bells. The aurora is believed to be produced by electric currents in the higher regions of the atmosphere. Its great elevation above the earth is evident from the fact that the same aurora has been witnessed at the same time in Moscow, Warsaw, Rome and Cadiz.

Franklin's description.—Franklin made the following remarks in his journal on the Aurora Borealis as observed by him at Bear Lake in latltude 65° North in the year 1825:—"From the difference in the appearence and activity of the Aurora at Port Bowen and Forts Enterprize and Franklin an inference may be deduced for observing this phenomena and its effects on the needle than in higher northern latitudes". "Bear Lake-Latitude 65° north—26 October 1825. These corruscations were extremely brilliant, and in continual motion. The principal feature was a broad band of light that extended along the northern part of the sky from W. N. W. to E. N. E. at an elevation of 20°, from which beams of a less intense light were frequently projected across the zenith from north to south, or in the contrary direction; and they sometimes reached the opposite horizon before they disappeared. The band as well as the beams seemed to be composed of an infinite number of slender rays which were highly inclined and exhibited the prismatic colours, the strongest tints being red yellow and green. The whole of the corruscations appeared to be interposed between the spectator and a thin filmy mass of cloud. The needle deflected during these corruscations 2° 41′ to the east and 1° 20″ to the west".

November 2d 1825. The Aurora this night was extremely brilliant and active, and exhibited the prismatic tints. The corruscations commenced with a highly illuminated arch, spreading from S. E. to N. W. across the Zenith, in which part it formed a corona, from whence slender rays were projected perpendicular downwards, going to the corruscation the appearance of a globe, with the meridians marked on it. This Aurora originally sprang from a mass of cloud bearing S. S. E.; which gradually changed its position to the eastward, and on its reaching the east point a band of light resembling the fringe of a curtain rushed forth and extended round the northern horizon at an elevation of 8°. The corona disappeared at the time this latter change took place and arches were projected in rapid succession from S. S. E. to N. N. W. south-north, and W. N. W. to south; all of them displaying the most brilliant colours. The needle betrayed its greatest deviation during the projection of these last-mentioned arches, and was, in fact, kept in a state of vacillation for about five minutes approaching towards, or receding from, the true north, according to the apparent motion of the rays of light. Extreme deflections of needle during these corruscations, 1° 25′ to the east and 2° 23″ to the west."

"December 7th 1825.—The Aurora this night was very generally diffused, and extremely active and brilliant. The most remarkable part of the corruscation was three perfect arches, at the several altitudes of 40°, 50° and 90°, having the same points on the horizon. From the lowest of this arch a beam flashed towards the horizon to W. N. W., which produce a change in the needle of 2° 45′, as above noted. When these arches became faint, a mass of light rushed from E. S. E. and in its progress to the N. W., in a horizontal direction the rays of light, of which the stream was composed, were seen vibrating backwards and forwards between the two extremes in the most rapid manner. During this commotion, which lasted ten minutes, the needle deviated between 39° 15′ and 41° 15′. If afterwards continued stationary for three minutes at 40° 45′, though the Aurora was violently agitated; but the motion of the light was then nearly circular, or in the form of a horseshoe, and confined to the zenith. The colour of the light was faint red. In a few seconds afterwards, the whole body of the light, being concentrated in the W. N. W. point, darted in an instant across the zenith to E. S. E., exhibiting in its progress a similar agitation in its rays to that already described. The corruscation then branched off the north, forming a broad band of light about 20° high, reassumed the horseshoe form at the latter point and its rays undulated through every part of this figure like the waves of the sea, or a rolling volume of smoke. During these last-mentioned changes the needle retraced its course, as shown in the three last notices, and remained stationary at 38° 05′, while the Aurora formed a zone that encircled the horizon at an elevation of 30°, in which shape it remained a few minutes and then disappeared."

Capt. Bernier.—Captain Bernier in his report of the voyage of the "Arctic" to Melville Island in 1908-09 reports: "The sun was seen on November 7th for the last time until early in the following February. Beautiful purple hues tinted the northern sky on some of the last days of its appearance. After the disappearance of the sun the aurora borealis was occasionally seen. These phenomena which in these northern latitudes appear in the southern sky, though perhaps more frequently sun on account of the extended nights are not more brilliant than those seen in the middle latitudes".

Paraselene.—Peary thus describes, in his "North Pole", the meteorological phenomena observed by him at Cape Sheridan, North Grant land:—"On the evening of November 11th, there was a brilliant paraselene, two distinct halos and eight false moons being visible in the southern sky. This phenomenon is not unusual in the Arctic, and is caused by the frost crystals in the air. On this particular occasion the inner halo had a false moon at its zenith, another at its nadir, and one each at the right and left. Outside was another halo, with four other moons.

Parhelion.—"Sometimes during the summer we see the parhelion, a similar phenomenon of the sun. I have seen the appearence of the false suns—or sun-dogs as the sailors call them—so near that the lowest one would seem to fall between me and a snow-bank twenty feet away, so near that by moving my head backward and forward I could shut it out or bring it into view. This was the nearest I ever came to finding the pot of gold at the foot of the rainbow."

Parhelia.—Parry writes:—"Parhelia and imperfect halos very often occured in the spring (1823), their angular distance from the sun being from 22° to 23°, but having nothing remarkable either in form, situation or colours, to need a separate description on each occasion. Parhelia occur most frequently and exhibit the greatest intensity of light at low altitude of the sun. This is often particularly observable in the short days, when these phenomena assume a very brilliant appearance soon after sunrise, decrease in splendour towards noon, and resume their brightness as the sun descends towards the horizon, continuing however distincly visible the whole time, and being sometimes accompanied by a more or less perfect halo undergoing corresponding variations. Another peculiarity observed in this winter (1822-23) was the rare occurence of the Aurora Borealis and the extraordinary poorness of its display whenever it did make its appearance."

The concluding month of this year presented more frequent as well as more brilliant displays of Aurora Borealis than we had noticed at an earlier period of the winter. The colour of the light was most frequently yellowish-white, sometimes greenish and once or twice a lilac thinge was remarked, when several strata, or undulating bands of streamers of light across the sky, appeared to overlay each other by very rapidly meeting, in which case the light was always increased in intensity". Double-moons, paraselene and other interesting meteorological phenomena were also noticed by Parry when at Igloolik.

Parry's voyage to Igloolik.—After passing the winter of 1821-22 at Winter island, Captains Parry and Lyon with their ships Fury and Hecla, sailed northwards along the east coast of Melville Peninsula which, like Melville Bay and Melville Island, was named by them after Lord Melville, the First Lord of the British Admiralty. They left Winter island on July 2nd. 1822 and arrived off the island of Igloolik, at the eastern entrance of Fury and Hecla strait, on July 21st, having taken three weeks to cover the distance of the two hundred and fifty miles, or about twelve milecs progres northward per day. Before they started from Winter Island the Wind had blown steadily for ten days from the W. S. W. which was very unusual and had opened up favourable leads between the land-ice and the exterior floes. Parry had previously got a very useful and what turned out to be a remarkably accurate sketch-map of the coast-line from an Eskimo women, named Igluliuk.

Shore ice.—Leaving Winter island on July 2rd, before a W. N. W. breeze and clearing the rocks at the entrance of the bay, they ran quickly north and eastward. The land was completely lined with ice extending two to five miles seaward and apparently firmly attached to the shores. The outer band of ice was of the "hummocky kind, consisting of broken masses left by the autumn and cemented together by the succeeding winter's frost. The ice in the offing was also of the latter kind and drifting rapidly about with the tides, leaving a navigable channel varying in width from two miles to three or four hundred yards.

Soundings.—Having passed Adderley's Bluff, which is much the highest land hereabouts they soon found the ice closing in on the land floe and made the ships fast to the latter, after a fine run of ten leagues without any obstruction. The soundings here were extraordinary, considering the bold appearance of the land; for at a distance of two miles they got only eleven fathoms on a bottom small stones and shells; and by the boats found from ten to twenty-two fathoms along the edge of the floe. July 3rd. They cast off and after sending a boat ahead to sound, ran along the margin of the floe. Between Cape Wilson and Point Elizabeth the land forms a considerable indentation and is here moderately high. At noon they were in latitude, by observation, 66° 50′ 40″ and longitude, by chronometer, 81° 51′ 12″. After sailing two miles towards Cape Wilson the ice closed in with the land floe and drifted to the S. W. with the extraordinary flood-tide, which they found to monopolise fully three-fourths of the 24 hours, besides running in general much more rapidly than the opposite abb-tide. The tide ran a full knot and a half and the two ships were crushed together by the grinding floes which resulted in the loss of one of the Hecla's boat which was torn to pieces by the Fury's anchor, the shank of which also badly cracked. At midnight July 4th, the ice began drifting north-east with the ebb-tide and in consequence of this movement a number of heacy floe-pieces came with great violence against the sterns of both ships and threatened to carry them away in spite of five stout hawsers attached to the land-floe. The ebb-tide slackned after running less than four hours to the north-east and, the ice-opening with only a slight breeze blowing, the ships cast off and following a lead became separated and beset in latitude 66° 54′ 17″, longitude 81° 24′ 50″ in 38 fathoms of water, the bottom consisting of sand and small stones. No land was seen to the eastward during the whole voyage in spite of a favourable voyage.

Owlitteeweek Island.—On july 5th, the Fury pushed her way under sail through leads in the ice to within 1¼ mile of Owlitteeweek island and made fast to the ice in nine fathoms, the tide flowing with great rapidity. Here for the first time the ship made fast to the smooth and level land-floe, which continued to run along the shore at a distance before described, the Hecla being twelve miles away and beset in the drifting floes. On

Owlitteeweek island deer, king-eiders, little long-tailed ducks, red and black-throated divers were abundant. Tern and silvery gulls and snow-geese were also seen. The island which is high on its N. N. E. but very low on its south side is composed of gneiss, the rocks presenting a wavy or serpentine appearance. Latitude 65° 55′ 58″, longitude 81° 38′ 43″-dip of magnetic needle 87° 47′ 13″ and the variation of compass was 62° 17′ westerly. Here Parry found the largest collection of heavy masses of grounded ice that he ever saw in one place. The soundings were never less than five fathoms with a regular decrease towards the shore. For the first time the ebb-tide was runniug fully as strong as the flood and setting more from the land to the eastward than before. "The atmosphere was most deceptive and the extraordinary degree of refraction altered all objects near the horizon in a curious manner. For some hours the Hecla's masts twelve miles away to the south-east, seemed thrown up into one peaked body, like an immense steeple, and at other times, she seemed alltogether flattened down into the form of a low and preposterously long ship without masts. The wind was light and several times veered round the compass in the course of the day, with now and then a little moist-feeling in the atmosphere."

Cape Wilson. — On July 7th, the ships rejoined each other through the leads and rounded Cape Wilson where the ice assumed a different and more dangerous character. The whole way from Winter island its margin had borne evident marks of tremendous external pressure, but it had hitherto afforded numerous bays or identations, into which a ship might be taken with some hope of finding shelter from the sea ice. Here, however, the floe, besides being infinitely heavier and more "hummocky" (for it was in many places from 8 to 12 feet above the water) was also so straight along its edge as to offer not the smallest security; while the enormous masses, everywhere piled up by recent pressure, appeared like so many beacons placed to warn a ship of the fate which she might expect to meet, if obliged to make fast in so exposed a situation. "Such however is the nature of this navigation, and the necessity of pushing on to the last moment of any clear water appearing, that to bestow a though on our next place of security, until the moment arrives, would be to lose opportunities, which no exertions could regain, and ultimately to mean certain failure. We therefore made fast on this occasion in the first place that presented itself, for there was, in fact, no choice; neither was there any time to lose, as the ice was beginning to close and would soon commence drifting to the southward, so that our only chance of holding on consisted in securing our hawsers as quickly and effectively as possible". They were now one and three-quarters of a mile from land in 21 fathoms. At a distance of one and a half mile from land they found 35 to 39 fathoms, the deepest casts since leaving Winter island. The ebb-tide here set to N. N. E., the flood to S. S. W., as before, but the former now ran about five hours to the other's seven but it was not, however, so strong by more than half a knot, so that the southerly set still considerably predominated. When the ebb slackened the stream almost immediately began to set to the southward bringing with it, as usual, the whole body of drift ice along the edge of the land-floe and quickly filling the narrow channel through which they had been making their way northward.

Treat Ice Pressure.—The ships were moored to the land ice by numerous hawsers, but so great was the pressure on the ship's bows from the huge drifting floes that the friction on the Hecla's hawsers became so great as to nearly cut through the bitts, and ultimately set them on fire, so that men had to keep pouring buckets of water on them. "A huge floe" Captain Lyon reported, "jammed the Hecla on her broadside and being backed by another large body of ice gradually litfed her stern as if by a wedge. The pressure at last became too heavy and the stream cable, with two six and one five-inch hawsers parted at the same time. Three others soon followed. The sea was too full of ice to allow the ship to drive, and the only way by which she could yield to the enormous weight which opposed her was leaning over on the land ice, while her stern at the same time was entirely lifted more than five feet out the water. The lower deck beams now complained very much, and the whole frame of the ship underwent a trial which would have proved fatal to any less strengthened vessel. At this moment the rudder was unhung with a sudden jerk, which broke up the rudder case and struck the driver boom with great force. In this state I made known our situation by telegraph, as I clearly saw that in the event of another floe backing the one which lifted us, the ship must evidently turn over or part in mid-ships. The pressure which had been so dangerous at length proved our friend, for by increasing weight the floe on which we were berne burst upwards, unable to resist its force. The ship righted and a small slack opening in the water, drive several miles to the southward before she could be again secured to get the rudder hung; circumstances much to be regretted at the moment, as our people had been employed with but little respite for three days and nights, attending to the safety of the ship in this dangerous tideway". The Fury was subjected to pressure of a similar nature.

Clear water and fine weather.—In the course of the evening an immense floe was separated from the land, just beyond them to the northward and, drifting out into the main stream of the tide, left the first clear space completely free from ice as far as the shore, since leaving Winter island. "This occurance, though it gave us evident proof that the discription of the ice was rapidly going on, at the same time increased the hazard of this navigation, for the pressure of such a floe in motion in a strong tide-way would be sufficient to crush the strongest ship, while the absence of land-ice in that part would render her more liable than before to be forced upon the shore. The wind came from S· S. W. at night, with clear and delightful weather, and a sky that might vie in beauty with that of an Italian landscape.

Open Leads.—On July 9th, they had a narrow escape from the heavy floes several miles in extent that had become detatched from the land and which whirled down on them before the strong tide. On July 10 th, the breeze freshened from S. S. W. and they continued northward through open leads one and three-quarter miles from the land in from twenty to 25 fathoms of water. There was very little snow on the land and numerous streams of water rushing down the hills and sparkling in the morning sun relieved the melancholy stillness of the desolate shore.

Barrow River.—They reached the Barrow River, twelve miles south of Cape Penrhyn, on July 11th, and south Ooglit island on July 12th. Here the land was so extremely low that as the sun got round ahead they could scarcely distinguish its points, and ran along chiefly guided by the soundings. In the course of the night they passed thousands of walrus, large herds of which were lying with their young on almost every loose piece of ice in sight. After this they met with no ice except in some loose "streams" and the soundings fell to nine, eight and seven fathoms, and the water appeared much discoloured.

Impenetrable ice ahead.—On July 16th., a great deal of high land came into sight to the north and east. After sailing a few miles they were disappointed to see an unbroken sheet of ice extending completely across the supposed passage from one coast to the other, and evidently from the floe being so level and continuous, the ice was last winter's ice and firmly attached to the land everywhere.

On July 17th and 18th, the ships ran into a heavy gale and were nearly driven on the ice-floes. The temperature of the water at the bottom of the sea was 31¾° by the Fahrenheit and the surface 34¾° by the same thermometer.

Igloolik.—On July 21st.—They anchored four miles off the shore of Igloolik in 11 to 12 fathoms of water, which had shoaled in two or three miles from 42 fathoms further east. They bore up to the edge of the new ice which surrounded the island and were met by a number of Eskimos who came to greet them in 11 canoes. They made an examination the next day of the sheet ice which filled the bay and Fury and Hecla strait and found it to be only a few inches to a foot in thickness and very rotten and full of holes. Parry accounted for the retention and late presence of this ice by the smallness of the tides round Igloolik, which rise and fall some five feet.

On July 22rd, the temperature of the air was 32° Fharenheit, the sea-water at fifty fathoms was 31¾° and 30¾° at the surface.

Tern Island.—Parry's ship visited a small rocky island, north west of the island of Igloolik, and anchored half-way between it and Neertonatko in 52 fathoms of water, in latitude, 69° 33′ 27″, longitude, 81° 09′ 13″ W.—The dip of the magnetic needle being 87° 37′ 09″ and the magnetic variation of the compass 82° 21′ 51″ wasterly. This small island is called by the Eskimos See-o-wak or Tern island on account of the immense number of Arctic Tern that make it their nesting place in summer.

Tern island is particularly dangerous for ships on account of its being surrounded by rocks and shoals, although the grounded ice is a tolarably safe beacon. The bottom of the sea consisted of a soft, greenish mud and near this point the compass of both ships were observed to be badly deranged by some intermediary local attraction. Tern is about three quarters of a mile long, N. W. to S. E. and is extremely narrow being in no part more than 20 to 25 feet above the sea-level. In the middle is a lagoon which communicate with the sea The island is covered with pieces of limestone and lumps of granite, gneiss, hornblende, mica-slate and some common iron-pyrites. When they landed the island was found to be literally covered with the eggs and young of the tern, which were met with at every step. The eggs were brownish-green with dark-brown irregular spots all over the eggs. Three eggs were rarely met with in the same nest and the eggs of the King Eider were found scattered amongst them.

Calthorpe Islands.—Captain Lyon at the same time with the Hecla visited the Calthorpe islands, which he found to be copmosed of gneiss and a counterpart in every respect of Winter Island in its mineral production. Many old abandoned igloos, skulls and evidences of previous Eskimo occupation were found on the Calthorpe islands, which at the time were covered with rich grass.

Fury and Hecla Strait.—In the month of August 1822 Parry and his officers explored Fury and Hecla Strait in boats and on August 26th. the two ships made a trial to pass through under all possible sail before an easterly wind. "The course being shaped and no ice in our way I then went to bed; but was immediately after informed by Mr Crozier that the compasses then had shifted from N. ½ E. which was the course I left them indicating, to E. ½ N., being a change of seven points, in less than ten minutes. After running half a mile in a true W. b. N. direction the needles began to return to their true position; in half a mile further they had resumed their proper direction and agreed exactly at North. Having sent a boat to the Hecla immediately on our noticing the first alteration, I found out from the Captain that a similar phenomena was observed to take place on board that ship; Which was following in our wake. The breeze slowly increasing from the eastward, and the weather happily unusually clear for that direction of wind, we soon arrived off the narrow part of the strait, immediately on opening which, we met a tide or current running about two knots to the eastward with numerous eddies and ripplings. By keeping on the south or Continental shore, and passing along by Cape North-East, within two or three hundred yards of the rocks, we succeeded with the assistance of the boats ahead in getting through the channel soon after eleven o'clock. The length of this narrowest part of the strait is three miles in an E. by S. and W. by N. direction; it is two miles across and nearly uniform in its width the whole way through. The rocks of red sandstone on the south side shelve gradually down from a height of three or four hundred feet so that in sailing through we had generally two fathoms more depth of water on the outer than on the inner side of the ship, the soundings continuing deep almost close to the shore. The opposite or northern land of the narrows, where on closer examination we found several islands, is also high, but less shelving than the other, and presenting, when clear of snow, a much darker appearence."

They were however, soon stopped by a barrier of fixed ice which stretched completely across the strait a little beyond them in one continous and impenetrable field through which the ships could not drive. So after a vexations delay of six weeks at the eastern entrance of the strait they had finally to anchor in 36 fathoms, on soft bottom, a mile and a half from high ragged land on the continent to the south and one and three-quarter miles from the comparatively low land of Liddon island.

Liddon island.—Liddon island consists of brownish sandstone with various shades of red, dark-brown and white and striped with curved lines in the manner described near Cape North-East (Point Pelletier). On the high part of the land, nodules of white quartz were found embedded in the sandstone and a great variety of other substances in the sandstone were lying in loose pieces on the beach. Of these the most abundant was a species of ironstone which from its weight, appeared to be rich ore and a large rock on the beach contained a good deal of asbestos.

The tides.—"The fact of our never having seen a stream of tide or current setting through the narrows of the strait in any direction but to the eastward, made it an object of curiosity to ascertain by observation on the spot during two executive tides, whether or not a permanent current existed there. By our observations it was perceived that in mid-channel the stream constantly set to the eastward from daylight till dark, and that when on the south shore a westerly set was observable, the tide was generally falling. From these observations it would appear that a regular stream of flood-tide sets to the eastward and that of the ebb to the westward in this strait; though at this season, the latter is not always perceptible on account of this rapid current presumably running against it in easterly direction. "The rise of tide in the narrows was 5 feet 2 inches, and the fall 5 feet ten inches and 7 feet on August 31st, and September 1st.

Ships return to Igloolik.—On September 17th, owing to young ice forming the ships broke their way out and returned to Igloolik and about two miles north-east of the mainland. Near Tern island before the ice took, they saw sea-horses, sillock (a small fish) and white whales dispering themselves, The native name of Ormond island was Khemig, meaning the plug or cork of a bottle. The mean temperature of the atmosphere at Igloolik, Lat 69⅓° during the six months. October to March, 1823, was-18° 3 as against-24° for the same period at Melville island, (lat 74¾°) in 1819-20, and 11 7° at Winter Island (lat 66½°) in 1821-22. The "corrected temperature" being a deduction of 3° for the warm atmosphere of the ship from the "registered temperature".

Elder's death.——Mr Alexander Elder, Greenland mate of the Hecla died of dropsy on April 15, 1821 and was buried near the observatory on Igloolik island under a tomb of stones, "with a handsome tomb-stone raised over the grave". By the end of May, ducks, silver gulls, snow-buntings, King-eider, Brent geese appeared in numbers and some brown, ash-coloured cranes, sandpipers, phalaropes and Lapland finch were also seen. Deer-tracks and seal were numerous on the ice. The open sea had approached to within three-quarters of a mile of Cape Arlagnuk and deer, geese and other wild-fowls were seen on Neertonatko island. Sea-scurvy made its appearence amongst the crews in July 1823 and limejuice was administered

On the first of August the ships were still as securely confined in the ice as in the middle of winter, except for a pool of water, about twice the ships' length in diameter, in which the ships lay.

Eskimo Names.

Repulse Bay	Ai-wil-lik
Chesterfieild Inlet	Ik-kee-rei-seuk
Land south of Chesterfield Inlet . . ...,.	Noo-wook

Southampton Island	Sead-ler-meoo
Hoppner Inlet	Tai-loot
Island off Cape Wilson	Ow-littee-week
Barrow River	Seag-gasse-O-wik
Ormond Island	Khe-mig
Quilliam Creek	Kangek-loo
Tern Island	See-o-wak
Amherst Lidden islands	Seag-glur-ru-ok
Cockburn land	Keiyuk-tarru-oke

Return voyage.—Parry and his ships left Igloolik on August 12. 1823 and with a southerly wind made over to the Calthrope islands, amid thick fog and a good deal of loose drifting ice. The weather continued thick and rainy and the next day they followed a south-westerly course in a perfectly clear open sea towards S. Ooglik island which they reached the next day They passed a great many walrus but saw no other animals. Near Ooglik island on the mainland is the Eskimo settlement of Ag-wisse-o-wik in lattitude 68° 23′ 58″.

On August 15-21 the ships were beset in the main body of the ice to the shore and had only a "hole" in the water to work in and they were unpleasantly close to the coast. On August 22rd. They were off Amitioke where a north wind and slack ice enabled them to make some progress. They drifted south past Cape Penrhyn on August 24th, drifting at the rate of 21 miles in 24 hours. They encountered a very strong current, two or three knots an hour, off Cape Penrhyn. On August 25th they were opposite the Barrow River in latitude 67° 17′ 28″ and had scarcely seen a bird since leaving Igloolik; walruses were rare along the coast south of Amitioke, August 27, they were off Cape Wilson and the island of Ow-littee-week. September 1st. They anchored in eleven fathoms of water some three or four hundred yards off the rocks on the eastern side of winter Island, when the Hecla nearly went ashore in the dark. Both ships were carried by the ice before an easterly wind some distance up Lyons Inlet. At the end of August a very heavy dew fell every evening immediately after sunset and was converted in an hour or two into hoar frost on the decks.

Fox Channel clear of ice in September.—The ships finally made their escape from the ice on September 6th after having been almost invariably beset for 24 days out of the last 26 since leaving Igloolik, in the course of which the vessels had been taken across no less than 140 leagues of ground, generally very close to the shore and always unable to do anything towards effecting their escape from danger. They then sailed along the north-east coast of Southampton island and Parry reported: "After now leaving the body of ice we saw no more on our return to the eastward which circumstance agrees with the accounts of Baffin in 1615 and Fox in 1631; the former after stretching over from Southampton islands without obstruction, and the latter appears not to have seen any ice the whole way up to the farthest north (Point Peregrine). I have no doubt that the same clear sea would be found to extend some distance to the northward of where Fox turned back, and that the band of ice from which we now extricated our ships continues down to the neighbourhood of Carey's Swan's Nest (on Coat's island) producing the obstruction occasionally met with by the Hudson Bay Company's ships on their return homeward in the autumn."

Parry and Lyon reached Deptford on the Thames on November 14th, after calling at the Orkney and Shetland isles on the way home.

Elder's Tombstone.—While exploring the south shore of Igloolik, I came across on a beach, at the water's edge, a large flat stone. On turning it over it proved to be the headstone of one of Parry's man,who had died in April, 1823, and had been buried in that desolate shore. The inscription read as follows: "Mr Alex. Elder, Greenland Mate, H. B. M. Ship Hecla. Obit April 15, 1823. Aged 36 years".

I could find no trace of the grave, as the stone had evidently been moved from its proper resting place by the ice-pressure.

Parry's Ice-Anchor.—Back from the shore, I found five old abandoned igloos, in ruins and built of stones, in one of which I found a curious old iron ice-anchor, formed like the letter S. and which Parry mentions in his report as having been left behind. This anchor which weight about 150 pounds, I brought back with me on Coggan's sled to Ponds Inlet and thence by sea to Quebec, as an interesting and valuable relic of Parry's visit to those waters, 90 years before. The old ruined igloos were half buried in gravel by the pressure of the ice. I could not walk far as my knee was still very painful, and I returned to camp.

No records found.—During my stay at Igloolik I searched everywhere for other evidences and records of Parry's visit, but, could find none. Perhaps had I been there in summer time, when the ground was bare of snow and ice, I might have been more fortunate.

Fresh meat arrives.—March 24th. In the forenoon I repaired my clothes, mended socks etc., and in the afternoon set some fox-traps round the island, using walrus skin for baits. Coggan arrived that evening with four caribou, some of which we fed to the famished dogs, as they had not eaten for nearly five days. We, too, were glad of the change of diet from the tough, rotten walrus on which we had been living since our arrival at Igloolik.

CHAPTER VIII

FURY AND HECLA STRAIT—TREMBLAY'S TRIP TO AGGO.

Fox-trapping.—On March 25th, 1913 the weather was intensely cold with a strong wind blowing from the South-east. In the morning I made a tour of my traps on Igloolik island, and set some more. I found two foxes that had been caught, and returning to the igloo, skinned them and, after supper, went to bed.

Igloolik Eskimos.—The natives used to be more numerous at Igloolik than when I visited them, as the majority had gone either to Ponds Inlet, to be near the ship, or South to Repulse Bay and Aivilling, where the American Captain Comer and a ketch tender to the Scotch Whaler Active had their headquarters.

The Iglulingmint are a small tribe occupying the west shore of Fox Channel, from Repulse Bay northward to Fury & Hecla Strait, and were the tribe met with and described by Parry, who wintered among them in 1821-22 and 1822-23. According to Captain Comer they numbered in 1903 only sixty persons, and are not increasing.

Nechillingmiut.—The Nechillingmiut are the most numerous tribe to the westward of Hudson Bay, and number about 450 persons. They inhabit the country to the westward of Igloolik and Aivillik, extending wetsward and northward to the Back river, and the shores and islands of the Arctic Sea. The Sinimiut were a small independant tribe, living about the southern shores of Committee bay, but they have now been absorbed into the Nechilliks.

Shaunuktungmiut.—Kenipitus.—Another inland tribe is the Shaunuktungmiut, allied to the Kenipitus, who occupy the territory to the southwest of Chesterfield Inlet Tyrrell came across these people in 1893 and 1894 on the banks of the Kazan river, north of the edge of the woods, where they live almost entirely on deer and musk-ox, the former of which they spear from their kayaks which are made of deerskin parchment sewed over a light wooden frame, while the animals are swimming in the water. This tribe of Eskimos appeared to number between five and six hundred souls. They seem to live entirely inland,

and thus differ from the maritime seal-hunting Eskimos, who inhabit all the Arctic coasts from Greenland to Behring sea. Their language is very distinct from the Eskimos of the Labrador and the north side of Hudson Straits, and also from the Eskimos of the delta of the Mackenzie river. Tyrrell compiled a vocabury of about 300 words of this tribe, which is appended at the end of this volume.

Walrus plentiful at Igloolik.—Igloolik is a favorite feeding ground for walrus, which feed on the clams and small fishes that are found in the shallow waters around the islands. The walrus abound there in great numbers in the summer and the natives informed me that sometimes they could hardly sleep for the noise made by the "barking" of the bulls as they lay basking in the perpetual sun-shine on the ice-cakes.

The Walrus.—The walrus although resembling the seal in its general characteristics belongs to a dintinct family. It is a carnivorous animal that has lost part of its teeth and has modified them by adaption to a particular regime. In the upper jaw it carries two enormous canine teeth or curved tusks that attain sometimes in length 30 inches, and a weight of 13 lbs; although the average length is 2 feet and weight 9 lbs. These tusks protrude downward from the upper jaw for about two thirds of their length. The tusks of the female are always smaller and thinner, and rarely attain a length of 20 inches. These tusks serve the purpose of enabling the walrus to clamber on the ice-pans, as a weapon of offence and defence and for prying the clams and shell which they chiefly live on from the bottom of the sea. The fish ivory although less valuable than that of the elephant, was worth in 1879, 40 to 45 cents the lb., in 1880 one dollar and one dollar and a half a pound, in 1883, 4 dollars and 4 dollars and a half per pound and the present price is probably $5.00 a pound.

Walrus hide.—The skin of the walrus is about three quarters of an inch thick, and even thicker on the neck, and is generally covered with cicatrices from wounds received in battle, during the breeding season. Young walrus have a yellowish-brown skin covered with short hair; as the animal grows older the hair becomes thinner and lighter in colour, and the skin of the older animals is often quite bare in places. The hide of the walrus is worth now about 40 to 50 dollars being sold by the pound and is increasing as it makes the best leather belting for machinery and is also used for "buffing " metal goods. Oil is made from the blubber. The usual length of the walrus is from ten to twelve feet but they sometimes are found as long as sixteen feet and an adult male will weigh from 1200 to 3000 lbs. They measure from ten to 13 feet round the shoulders. They live on clams crabs, shellfish, oysters, molluscs, small fish and even on young seal, They swim with great speed in the sea, but on land or on the ice their progress is laboured and slow.

Habits.—When not excited the walrus is lazy and indifferent, but when alarmed or angry they become active and dangerous. Their bark resembles sometimes the roaring of a bull, at others the bark of a dog, and when very angry they give forth a terrible cry somewhat like the neigh of a horse. When one is attacked all the herb rush to the rescue and they will attack a boat and endeavour to overturn it by gripping the sides with their tusks or to crush its sides with a blow of their powerful heads, which can break eight inches of solid ice, and which, on account of the great thickness of skin and bone is impervious to bullets. The best means of defence, when attacked by walrus in a boat, is to fire them a solid metal jasket bullet through, the head though they have no fear of bullets. When a walrus is wounded it is carried away and supported by its companions, who with great intelligence will bring it to the surface, from time to time, to breathe. The male is faithful to the female, and they meet in the breeding season on the rocks of the coast in the months of May, June and July. The breeding season lasts about fifteen days, when the males engage in terrific and bloody combat making full use of their terrible tusks. In the following sprîng the female gives birth to one, rarely two, small ones. They take great care of their young, supplying them with milk for at least two years, and protecting them fiercely against all foes. At this time the females are said to live by themselves in separate herds.

Habitat.—The walrus is found all over the Polar Ocean and along the coasts of the land lying inside the Arctic circle. They are especially numerous in Smith Sound, Jones Sound, along the coast of Ellesmere, in Lancaster Sound, Cumberland Gulf, and Fury and Hecla Strait. The whalers and natives report them as very plentiful in Wellington Channel. They are very numerous in Fox Channel, Frozen Strait, and Roes Welcome; they are also found on both shores and on the islands of Hudson Strait. When the St-Lawrence was discovered they were found as far south as the Magdalen islands and on the coast of Labrador now they are rarely killed at Cape Chidley, the northern point of the last coast. On Hudson Bay they were formerly found as far as south as the Paint islands on the east side of James bay, but their southern limit is now about latitude 57° N., on the Belcher islands.

In 1852 as many as 3000 and 4000 walrus were found in a single troop along the coast of Greenland.

A Walrus Hunt.—Low gives the following interesting account of a Walrus hunt near Charles island at the western end of Hudson Strait:—"Soon after leaving the ship in a small steam launch, several hundred walrus were seen sporting in the water about the islet. They were in bands, varying in number from ten to twenty, each band probably composed of an old male and his harem. A band would be singled out, and the launch, at full speed, would put after it. When the animals became aware that they were being chased, they would endeavour to escape by diving, always keeping close together. At first they would remain under for several minutes, and would travel four hundred yards; as the chase became hotter and hotter, the length of the dive would gradually decrease, so that, finally, the animals could hardly remain below the surface. The launch was forced among the mass of frightened creatures, and when directly over them, a man in the bow would select a large one and drive a harpoon into it. The head of the harpoon was fastened by a few fathoms of line, to our empty water keg, as the animals sink as soon as they are killed and the buoyancy of the keg is required to keep them from being lost. When one had been harpooned, the launch was stopped, and the rest of the band continue to flee. Now comes the dangerous moment of the chase. The wounded walrus rises to the surface, and immediately attacks the launch, which it endeavours to capsize by fixing its tusks over the side. Quick shooting is the order, and even with a storm of bullets, many a monster has to be rapped over the head, and pushed away with guns and spears. After the experience with the first few killed, it was found that by keeping the propeller in motion and the whistle blowing, they would not attack the launch, but would waste their energies in an endeavour to destroy the keg; consequently the danger of the sport was considerably lessened. Upwards of half a dozen shots, at close range, were necessary to kill each walrus. As soon as one was dispatched, it was towed to the ship, or to a convenient cove on the shore. Seven were captured during the day, and hoisted on board, where they completely filled the after deck. Owing to the difficulty of securing these large animals, at least twice that number, fatally wounded, were lost; we later found this to be the usual proportion of killed or captured, where these animals are hunted for their skins and blubber, a waste of life altogether too great. Parry writes in his book "North Pole": The hunting of these monsters is the most exciting and dangerous sport in the Arctic regions. The polar bear has been called the tiger of the north; but a contest between one or two, or even three of these animals and a man armed with a Winchester repeating rifle is an entirely one-sided affair. On the contrary, a contest with a herd of walrus,—the lions of the North,—in a small whaleboat, will give more thrills to the minute than anything else I know of within the Arctic Circle."

Yet the Eskimo in his frail and cranky kayak will paddle out without a moment's hesitation, sink his harpoon, with a line and seal bladder attached, in one of these savage monsters, and eventually dispatch it with a lance. Old Tom Lasso, Peewiktoo's father, was a famous walrus hunter, and once had his kayak upset in a struggle with a wounded walrus, and was barely saved by some more Eskimos who where close by, and who came to his rescue in a boat.

Start for Aggo.—March 26th.—At ten a. m. Takkowah and I started on a flying trip through Fury & Hecla Strait to Aggo, with a light sled and 14 fresh dogs and provisions, in the shape of walrus and seal meat to last us for a few days only, as I expected to kill some seal on the way, and at Aggo, the natives told me, there was a large cache of salmon, which had been caught by Ikkipareah in the Fall.

Aggo.—Aggo is situated at the southwest corner of Brodeur Peninsula on the Gulf of Bothia and is 150 miles from Igloolik, 100 miles from Scheming, 230 miles from Arctic Bay and 480 miles from Albert Harbour, Ponds Inlet.

Object of trip.—My object in going to Aggo was to find out if Wilson had gone there from Ponds Inlet as arranged, with a fresh supply of provisions and cartridges, as I had no provisions at all and not many cartridges. I also wished to visit Fury & Hecla Strait and examine the rock formation on the north shore. I borrowed 3 dogs from Eetook-sar-djooa (the father of Takkowa), 7 dogs from Takkowah, one from Akkriagro and three from Peewikto, making altogether fourteen dogs. I left Peewiktoo and Tootillik at Igloolik in order to rest his dogs and to attend to the fox traps in my absence. Takkowah's wife also accompanied us, as an Eskimo seldom travels without his wife.

Enter Fury and Hecla Strait.—The day was fine, clear, cold and sunny, with a light northerly breeze blowing in our faces. As we left the island of Igloolik the ice was very rough and piled up along the shore, and several times our sledge was nearly broken. We travelled about N. by W. towards the long narrow point which forms the south-east entrance to Fury & Hecla Strait and which I named Pelletier Point in honor of the Canadian Minister of Posts, and as we travelled, I gained a splendid view of the relative bearing and conformation of the islands and mainland to my left. The three small islands to north-east of Point Pelletier are so closely clustered together, that, as we approached them from the south, they appeared as one island. Each of these islands is about three quarters of a mile in diameter and are composed of black-brown rock and are about 200 feet in height. They are distant two or four miles from Cape Griffith. I called them the Triplets.

Bear tracks.—After we passed these islands, we came on the fresh tracks of a two-year old male polar bear. We camped in an igloo made of frozen snow-blocks in the centre of the strait nearly the half-way between the three small islands and the point on the north-east entrance of Fury & Hecla Strait, which I named Point Sevigny after the Federal Member of Quebec. I could see vapour, rising like steam, from some open water holes to the west. The night was very cold, and the temperature throughout the trip averaged between 30° and 50° below zero.

Plenty of Sun light.—March 27th.—I started about sun—rise every day and travelled while the sunlight lasted, there being about fifteen hours of sunlight at this time; the days gradually lengthened out until in May the sun was shining day and night, revolving in the heavens like a great golden ball of fire.

Fine weather.—The day was clear and cold with a steady north-west wind blowing in our faces. With the exception of one day, when leaving Aggo on the return journey, the weather was fine and clear throughout the trip, which gave me a aplendid opportunity to study the topography and formation of the coasts on each side of the strait.

Good ice.—The ice across the eastern end of Fury & Hecla was fairly good, and as the sled was light and on 14 dogs in good fettle, we travelled fast and reached Sevigny Point in about an hour. The distance across the strait between Pelletier and Sevigny Points is about eight miles. Sevigny Point is encircled by five small rocky islets, which lie from half a mile to a mile from the shore, with good smooth ice in between.

Ormond island.—When crossing the strait I had good view of Ormond island, which lay about seven miles to the west, in the very centre of the strait. Ormond island is about eight miles long from east to west and six miles wide from north to south and consists of a rusty-btown rock—probably gneiss—which rises from 100 to 150 feet above the sealevel in rounded knolls. To the north of Ormond island, and between it and the north shore,

1—Iceberg in Lancaster Strait.
2—Cape Ross, Cornwallis Island.
3—Beechy Island.

Barrow Strait ice

is another smaller island of the same rocky character, about 3 to 4 miles long and two miles wide. On each side of this island, which I named Elder Island, after Parry's mate who died and was buried at Igloolik, is a channel with a very swift current running. The southern channel between Elder and Ormond islands is about a mile wide with an open water hole caused by the swift current about a mile long and half a mile wide. The northern channel between Elder island and the north shore is about half a mile wide with an open water hole about 500 yards long and 200 yards wide. Through both of these narrow channels a very swift current runs, the flood tide to the east and the ebb tide to the west; the current flowing east being about one and a half knot faster than the one flowing west, which accounts for the constant jam of old Arctic floes at the eastern end of Fury & Hecla Strait.

Ship passage.—Between Ormond island and the south shore of Hecla & Fury Strait, the main channel is from three to four miles wide with a very swift current flowing. In the middle of this passage there is an open water hole, which does not freeze over in winter, about two miles long and ¾ of a mile wide. Through this channel lies the only safe passage for the ships. Soundings taken by Parry in 1823 showed the depth to be between 30 and 35 fathoms.

Numerous seals.—Seals in great numbers were continually bobbing their heads above water in each of the three open water holes in the vicinity of Elder and Ormond islands. In the most northerly one, between Elder island and the north shore, I killed seven seals in nine shots with my 280 Hight Velocity Ross, but succeeded in capturing only three, as young Takkowah was not very expert with the harpoon and the swift current soon carried the bodies out of reach under the ice. One has to aim quick to hit these seal, as their heads, which offer a target of only 3 inches square, would bob up for an instant to breathe and then disappear. The nearest range was about a hundred yards and the farthest about 300 yards. It was very disappointing after killing seven to be able to recover only three, especially as we needed the meat so badly for the dogs and our own nourishment.

A Seal barpoon-gun needed.—The Eskimos need badly a good harpoon spring or air-gun that would throw a light harpoon and barb with a line attached some 75 yards, as they can only throw the hand-harpoon about 25 yards and they lose more than half of the seals killed through inhability to recover their bodies, which are swept away by the current before the Eskimos can reach them. And the very existence of the Eskimos, in winter time, depends upon their ability to catch enough seal to provide themselves and their dogs with seal meat and blubber for fuel.

Dangers of water-holes.—The ice at the edge of these open seal holes is only about one and a half inch thick, and piled all around the edgee are large, flat, sharp-edged and slippery cakes of ice which, render a near approach to the water very difficult and dangerous. For a distance of 100 yards round the hole the ice was only some 5 inches thick and covered with soft, wet slush. Under it the tide rushed and roared as through a mill race. We betide the man who fell in, he would be frozen and swept away under the ice in a twinkling. Peewiktoo nearly perished in this manner at Scheming owing to the thin ice-edge breaking under his weight and he just managed to save himself by throwing himself backwards on to his back on the solid ice. Two men should always go after seal at these holes and be roped together, with one man standing back on the solid ice and the other, the hunter, near the edge of the water. An Eskimo of Igloolik who was hunting seal the year before my arrival at a water hole near there also nearly lost his life through the ice-breaking. Fortunately he was accompanied by his wife who succeeded in pulling him out with a harpoon line.

Feed the dogs.—We had great difficulty to harpoon and haul out the three seals that I had shot, and after skinning them in the freezing temperature, with our feet and hands nearly frozen, gave the hungry dogs a good feed. We left the carcase of one and the skins and spare blubber of the other two in a snow cache on the north shore, to pick up on our return from Aggo. I took with me some of the blubber for our seal stove.

Leave record.—I climbed the rounded point on the north shore, opposite the water hole, where the land consists of rolling hills, about 200 feet high of rusty black rock, much cracked in all directions. On the top and about 120 yards back I placed a long biscuit barrel stave upright and well driven home in a crevice of the rock, on which I cut my name and placed at the foot, under a heavy stone, a 280 Ross cartridge, containing my name, the name of the schooner, the date and a short memorandum of the route by which I had travelled. The barrel stave is visible for a long distance on the strait, from south, east and west.

Old Arctic floes.—After resting for a couple of hours, to give the dogs time to digest their meal, we continued west along the northern coast to the next point, about 11 miles west of Elder island. Here we struck a very large pan of old Arctic ice which stretched right across the sound and which consequently could not pass last summer through the narrow channels between the islands and the shore into Fox Channel. This ice was hard to cross, being full of holes and covered with large lumps and broken masses of ice. These old pans were between ten and fifteen feet thick.

Rocky islet.—Near the point, on its east side is a small square rocky islet about 100 yards from the shore. This islet rises about 150 feet straight up from the water with square perpendicular sides composed of a dark brown black rock. The coast is of the same formation.

We camped that night out on the old Arctic ice-pan, about 3 miles from the shore, opposite a high mountain about 1000 feet high, on the north shore.

Sandstone coast.—March 28th.—Starting at sunrise we continued west along the north shore. About 12 or 13 miles from our last camp, the character of the north coast changes,—the rusty black rock being succeeded by a salmon-pink sandstone formation, the smooth, low, rounded hills stretching back about 6 miles to the north, where they terminated in a high range of black hills, rising to a height of 1000 feet and running east and west. The stretch of sandstone deposit continues along the north shore for a distance of fifty miles and terminates on the west shore of Autridge bay, where it is succeeded by the same rusty black-brown rocks which form the general formation of the coast.

North shore.—The snow-capped peaks on the north side of Fury and Hecla Strait were trigonomitrically measured by Parry's officers and found to be 1447 feet in height.

Parry describes a wide area of a similar sandstone, probably the base of the cambro-silurian, which separated the hihglands of the interior of Melville Peninsula from the western shores of the northern parts of Fox Channel. These rocks are continued on the north side of Fury & Hecla strait. Parry reported having found coal in Autridge bay.

Rough ice.—We followed the north shore all day; the ice was very rough, consisting of old Arctic pans. Several times the sled upset and nearly broke my leg as well as the guns that were lashed on top. The dogs travelled very fast and the light sled careened, bumped and glided over the rough slippery hummocks in all directions. Every now and then a dog's trace would catch in the jagged ice and I would have to run full speed to free it before the sled run over and killed the dog. I had hard work to keep up with the dogs, and it was a hard long, hard, trying day. About noon I saw a fox running over the ice and started after it, with the rifle, but, frightened by the dogs, he escaped in the rough ice. I saw also the fresh tracks of a bear and a wolverene. We made forty good miles during the day, and after passing over a frozen, shallow bay, formed like a lake and covered with salt water ice, camped on a low flat point about the middle of the sandstone belt near a large mass of Arctic ice, about 25 feet high, that had been pushed up on the low shore by the pressure of the heavy pans.

An eventful night.—We were all tired out by the hard days work of running behind the sled, tugging at the up-standers to keep it from upsetting and from freeing the dogs, traces when caught in the rough ice. I ate a small piece of meat, barely cooked on the seal stove, while Takkowah and his wife contented themselves with chewing some raw rotten walrus blubber, meat and skin. I tried to eat a piece of this walrus but it made me sick, as it smelt worse than a rotten onion, was tough and sticky as glue and had the colour of Paris green. The less said about the taste of it, the better. Both flavour and smell haunted me all night. To make matters more uncomfortable the seal stove began to smoke in the middle of the night and nearly suffocated us, as we slept in our frozen sleeping bags. The acrid smoke and fumes from the burning blubber became so dense and choking that, in desperation, I burst a hole in the side of the igloo and we all crawled out into the bitter wind, coughing and gasping for breath, while the tears that flowed from our aching eyes froze on our cheeks. The fourteen famished dogs some of them very fierce started to rush into the igloo, where they would have torn every thing to shreds in their mad hunger, and would have devoured our small supply of meat. We managed to break their rush by beating them over the head with snow knives, pieces of bone or anything we could lay our hands on. Had they succeeded in breaking into the igloo they would have devoured in a twinkling every thing we had, meat, bedding, harness, and clothes and our plight would then have been desperate as until we reached Aggo, still 80 miles away, we could find no walrus seal or bear to give us nourishment and we were as far away from Igloolik. Without food, fuel, bedding or harness we should soon perish in the bitter cold. We crawled back into the igloo after the fight was over, half frozen and, been forced to extinguish the fire on account of the smoke, found it almost as cold inside as on the outside. It was one of our many miserable nights. The temperature was all of 45° below zero.

A dog fight.—March 29th.—As Takkowah and I were packing the sled ready to start, the starving dogs made a rush for the igloo, where was Takkowah's wife, alone. For fully five minutes we had another stand-up fight of the most desperate kind with a solid mass of snapping, tearing and yapping dogs inside the dark igloo, where the woman was crouching in one corner in terror. If the dogs had once gotten her down it would have been all over with her. She would have been torn to pieces and devoured in no time. I used first, foot and elbow on the fighting pack and so closely packed were we in the small igloo that it was hard to get a good swing. I played mostly for the head and the heart of the snarling, worrying brutes, whose eyes gleamed and white teeth snapped all round me. Takkowah laid about him with a stick in the narrow snow porch which was also filled with the rest of the mob that were struggling and fighting to get inside. Once he brought his stick down with a whack on the back of my neck, in the dark, and I though that my neck was broken. The dogs bit and tore at my deerskin clothing but fortunately did not reach the skin. I caught them by the throat, kicked them in the ribs and smashed them with my fist over the nose, till I nearly killed half a dozen. They were quite mad and beyond all control. I nearly several times get my revolver to shoot some of them, but was afraid I mights hoot the woman in the dark. Gradually the tide of battle turned in our favour, and after sending some of the largest and fiercest of the dogs yelping and limping outside from the force of our kicks and blows, we managed to drive the rest of the pack from the igloo. I nearly broke my right thumb on the forehead of one large brute as he made a spring for me and it pained me for months afterwards. Four of the dogs were so badly punished they could hardly pull their traces tight all that day. It was touch and go as they were half-starving and wolf-like in their attack, when once started, they had eaten nothing and had been hard driven for two days since the meal we gave them at the sea-hole and the intense cold added to their hunger.

Tremblay Point.—The weather continued clear and very cold, and a bitter west wind blew in our faces. The first three or four miles was over very rough old Arctic pans, when we struck good smooth ice which lasted all day and we travelled fast. We crossed the mouth of Antridge bay which is about 18 miles wide from east to west and runs back about six miles. Here the sandstone ends and runs into a wall of rusty-black rock that rises straight and sheer from the water on the west side of the bay. The wall of black rock puts out 150 feet high at right angles from the north shore for a distance of six miles, and terminates in a black rocky point, which I named Tremblay Point, at the north-west entrance of Fury & Hecla strait. Here I erected another barrel stave, with my name cut on it, and placed another record at the foot. This stave is visible for quite a distance from the sound all round the point.

Barren Quartz.—Tremblay Point is traversed by a number of veins of white, barren quart . which contains no trace of mineral.

C. Hallowell.—From this point, we continued round Cape Hallowell for about 15 miles in a north-westerly direction, keeping a mile to three miles off the shore, the coastline consisting of dark, rusty-looking hills, about 600 feet in height, sometimes almost perpendicular, at others having a more easy ascent.

Grassy valley.—We camped for the night on the ice about thirty feet from the shore, and a mile beyond a valley, about two miles wide, that penetrated the hills by gradual ascent in a north-easterly direction for about three miles, and which ended apparently in a high hill. This valley was covered with good grass and affords good pasturage for caribou in the summer months. I saw no traces of any creek running down the valley.

White Inlet.—Lieut. Reid, who accompanied Parry, reported: —"To the southward of Cape Hallowell are several small rocky islets. Twelve to fifteen miles from C. Hallowell is Whyte Inlet which extends inland five or six miles in a north-east direction, its general breadth one to one and a half miles. At the head of the inlet I found a ravine running into it and the vegetation here was more abundant than any I had seen during the voyage. We saw also the remains of two Eskimo huts which were old and supposed to have been winter habitations."

I saw no signs of these small rocky islands near Cape Hallowell unless he meant the islands on the opposite side of the strait, and where Whyte Inlet appears on Parry's chart on the east end of Autridge Bay, I found no sings of any such inlet as Lieut. Reid journeyed,, according to his own account, from 5.30 a. m. till 9 a. m. beyond Cape Hallowell. I imagine the cartographer of the expedition was misled and should have placed Whyte Inlet about fifteen miles on the north-west side of Cape Hallowell, which would make it coincide with the long valley, where I camped, opposite the large island south of the entrance Aggo Bay.

Large island.—Almost due west of our camp and about eight miles away is a large island, which was visited and explored by Mr Lavoie in 1911.

March 30th.—Following the coast-line in a northerly direction round an easy bay, about four miles wide and three miles deep we reached a point where the ice became rough and hard to travel over. To avoid this we kept a mile off the point and soon the ice became smooth again. From the point a 3 foot crack in the ice floor ran due south in the direction of the large island. At this crack we found the remains of a seal which had lately been devoured by a female bear and her two cubs, about six hours previous to our arrival. The tracks, according to Takkowah, were those of a 3 year old female and two yearling cubs. We followed the tracks westward for about four miles when the dogs lost the scent and we then headed straight for Aggo which we reached at 6 p. m. The native camp was on a sloping point which juts when out about a couple of miles from the north shore.

Here we found the remains of Ikkipareah's old snow igloo and that of his son, who were away at Ponds Inlet and who, with their wives and families, are the only permanents residents at Aggo.

Salmon cache.—We made a new igloo and being very hungry, were fortunate to find a cache near by under a heap of stones, with ten frozen salmon in it. Part of these salmon had already been eaten by foxes, whose tracks were very numerous around the cache. In my hunger I seized a large frozen salmon which weighed about seven pounds and devoured the whole fish while helping to build the igloo, as it was the first full satisfying meal that I had had since leaving Scheming three long weeks before. When the biscuits were finished at Scheming, I had to live on raw seal and walrus, often putrid or on caribou meat that was full of maggots and so thin as to be almost uneatable. No one who has not actually experienced it, can form a conception of the pangs and terrible craving that haunts one mind and wreck the system as a result of continual hunger endured for any length of time. Not only had I been suffering all these weeks from unappeased hunger, but for about six weeks I had been suffering the tortures of frozen hands, face and feet from the intense cold, often wet through, with frozen clothes and sleeping bag and with my limbs racked and aching from long, stumbling marches over rough ice and heavy snow and from constantly hauling and tugging at the sledge. My mind all the time was constantly filled with anxiety where to find food for ourselves and the dogs and whether our cartridges would hold out and enable us to reach Ponds Inlet.

So wolf-like was my hunger and so desperate were the conditions that I firmly believe, if any one had attempted to deprive me of that salmon, I should have shot him on the spot. Takkowah and his wife also gorged themselves on the frozen salmon until they could eat no more. To the famished dogs, that had drawn us 120 miles with nothing to eat for three days, we also gave a scanty meal.

We all passed a very restless night after our surfeit of salmon and it was two days before I felt well again. The fear of death itself could not have stayed me from eating my fill. I could well sympathize with poor Enoo-arah of Toolooria who died from overeating after a prolonged fast on a bear hunt. But the relief from the continous pangs of hunger and from the ceaseless anxiety as to where the next meal was to come from was too great to be endured, and I threw caution to the winds. It was a case of eat, drink and be merry, for tomorrow we may die.

Aggo.—Aggo is a fine circular bay about six miles wide at the south, where the entrance lies, and widens out to ten miles in width and depth. In the north-east corner is a long narrow arm, about 8 miles long and 2 miles wide, which runs to the north-east. Into this sound the lake of Ibbi-sauktoo discharges by a river about 8 miles long. Both river and lakes teem with salmon in the summer. Up this frozen river and lake, in winter, lies the sled trail to Scheming.

In the centre of the main bay, on the north shore and about six miles west of the village promontory is another river which discharges from Aggo lake, which lies some six miles to the north. This lake and river also abound in fine salmon.

Aggo bay is surrounded by high hills on all sides, 1000 feet in height, which slope at an angle of about 35° straight into the water. There is no beach to speak of along the shore. The rock is granite and rusty gneiss, like the rest of the coast. Low describes the rocks that compose the high cliffs of Brodeur Peninsula north of Aggo, on the east side of Prince Regent inlet as basal sandstone and shale overlaid by limestones, which in places are interbedded with beds of gypsum.

Mr Lavoie made a survey of Aggo and the coastline north to Cape Kater in 1911, for the Canadian Government, but I have been unable to obtain a copy of his report or map.

In the bay, in summertime, are found seal and walrus but no narwhal. In the hills are numerous caribou, fox, wolves, wolverene and hares.

March 31st.—Starting early we travelled west for six miles along the north shore of the bay to the mouth of the Aggo river, where we found a large cache of salmon. On opening the cache we found that all the fish were frozen together and had great difficulty in prying them apart. We took out about fifty of these, which weighed in the aggregate some 200 lbs The average being from 3½ to 4 lbs. Some weighed 7 lbs.

We returned to the igloo by noon and I spent the rest of the afternoon while daylight lasted, in filing about an inch and a half of the muzzle of Takkowah's old 303 Martini Henry rifle, which some Scotch whaling ship had brought from England. The muzzle had become bulged through being fired too close to the ice at the seal holes, the gas pressure having burst the muzzle. I also fixed the fore-sight and it shot well after that.

Leave Aggo.—April 1st.—Disappointed at not finding any news from Wilson at Aggo, whom I expected to meet there with a fresh supply of cartridges and provisions, or at least that Coonoo, his Eskimo, had been sent there to meet me, I decided to return to Igloolik, hoping to find them there. Before leaving, I left a note in English for Wilson, in case he should arrive there later telling him of my movements and where he could overtake me. I learned later that he was ill at the time with congestion of the lungs and could not leave Salmon River.

I also left a written record in a cartridge shell under a pile of stones on the top of Aggo point, about 100 feet above water-level and 100 yards back from the shore, surmounted by a barrel stave with my name carved on it.

A bad storm.—It was a terrible day on which to start out on a journey, but my food supply was limited, my supply of cartridges was running short and I had many hundred miles to traverse before reaching Ponds Inlet.

The wind blew a heavy gale from the south-east, right in our faces, and was so strong at times that the dogs would turn tail to the wind and refuse to pull the sledge. They could not hear us when we shouted at them and we could scarcely throw the long dog-whip against the wind. The gale was açcompanied by a whirling storm of sleet and snow, which blinded and nearly choked us, and caused us to lose the trial we had broken a few days before. The hard snow and sleet beat upon and stung our half-frozen faces till they burned as if pounded by a sandstorm. We could not see thirty feet in front of us, and the leading dogs looked like blurred spots, so thick was the driving snow.

The pleasures of Arctic sledding.—A few miles fom Aggo we ran into a field of very rough, jagged blocks of ice, which lasted for several miles The sledge capsized a dozen times and the dog's traces were continually catching and breaking on the sharp ice projections. We were kept busy righting the sled and repairing the broken harness. I was several times nearly caught between the heavy sled runners and the ice when walking and running alongside in order to guide it, as it would suddenly swerve and swoop down on me from the summit of a rounded and slippery ice-hummock. Had I been caught I should assuredly have lost a leg, as the heavy, polished, steel shod runners cut like a guillotine when pulled at speed by a strong team of dogs. And to lose one's leg under the circumstances was to lose one's life. Sledding in the Arctic is no child's play especially when the sled is slipping and sliding over rough cakes, jagged pinnacles and rounded hummocks of slippery ice in the semi or total obscurity of an Arctic storm. It is hard shoulder and heart-breaking work all the time, save when one can ride on the sled for a short space over smooth, level ice, which only occured at rare intervals during my trips. In places I would have to hack and saw a trial with axe and saw through the rough bouldery ice that blocked the path, while the tired and hungry dogs lay whining and shivering in the bitter blasts of the blizzard.

Eskimo Dog-Power.—A strong and numerous team of dogs will draw a lightly loaded sled over level ice at a rate of seven to ten and even twelve miles an hour,—so fast that running one's hardest you cannot keep up with them, and the keen frosty air cuts your lungs like a knife. When they scent a seal-hole they will suddenly dash in that direction at a 20 miles an hour gait and no power can stop them until they reach it. Then is the time to fling oneself, breathless, on the flying sled and hang on for dear life, until spurt is over. Over good level ice, a good team of dogs will draw a heavily loaded sled from four to five miles an hour and keep it up all day. Over bad ice they will not average over two miles, and in very hard places, not one mile an hour. The length of the day's journey depends upon and varies with the conditions of the ice, the weight of the load, and the condition and number of the dogs. One day you will cover forty and even sixty miles in a day without any trouble, the next, after the hardest kind of work, you will be fortunate if you make five or six miles. A fair average is from 15 to 25 miles a day. When passing round a shore of steep cliffs where the action of the tide and wind is strong. you may spend days waiting for the moving pans to freeze together before a passage can be made at all.

Eskimo Dogs.—Examination of the vertabrae by Mr Skeoch of Parry's Expedition to Igloolik showed that the Eskimo dog has the same number of vertebrae and corresponds with the well-known anatomy of the wolf-cervical, 7; dorsal 13; lumber 7; sacral, 3; caudal 19.

On the subject of the ability of the Eskimo dogs Parry writes —"The rate at which they travel depends, of course on the weight they have to draw and the road on which the journey is performed. When the latter is level and very hard and smooth, constituting what in other part of North America is called "good sleighing", six or seven dogs will draw from eight to ten hundred-weight and will easily under these circumstances, perform a journey of fifty to sixty miles a day-on introdden snow, five and twenty miles or thirty miles would be a good day's journey. The same number of well-fed dogs, with a weight of five or six hundred pounds (that of the sledge included) are almost unmanageable and will on a smooth road run any way they please at the rate of ten miles an hour. The work performed by a greater number of dogs is, however, by no means in proportion to this; owing to the imperfect mode already described of harnessing these sturdy creature, and to the more frequent snarling and fighting occasioned by an increase of numbers.

"Though the dogs are kept in training entirely by fear of the whip, and indeed without it would soon have their own way, its immediate effect is always detrimental to the draught of the sledge; for not only does the individual that is struck draw back and slacker his trace, but generally turns upon his next neighbour, and this passing on the next occasions a general divergency accompanied by the usual yelping and showing of tooth. The dogs then come together again be degrees, and the draught of the sled is accelerated; but even at the best of times, by this rude mode of draught the traces of one-third of the dogs form an angle of thirty or forty degrees on each side of the direction in which the sledge is advancing. Another great inconvenience attending the Eskimo method of putting the dogs to, besides that of not employing their full strength to the best advantage, is the constant entanglement of the traces by the dogs repeatedly doubling under from side to side to avoid the whip, so that, after running a few miles, the traces always require to be taken off and cleared.

On this day, owing to the blinding storm, we soon lost all sense of direction and Takkowah, who was young and inexperienced kept allowing the dogs to work away from the wind and from the land, when we ran the risk of losing the land altogether and of running full tilt into open water of the gulf of Boothia. I had hard work to make him keep to the left against the keen, cutting-wind and snow-blasts so as to strike and follow the coast, which we eventually reached about a mile north of the igloo, where we had camped on March 29th. Following the shore which I recognized, we soon reached the igloo, where I had left a piece of seal-meat, some blubber and a small piece of rotten walrus, which were inestimable treasures to us at that time, and which I was anxious to recover. We reached the igloo completely exhausted by our battle with the blizzard and with our clothes wet through with the damp snow that penetrated our sleeves and drifted down the backs of our necks.

The dogs were completely fagged out and curled up at once and went to sleep in their harness on the snow.

We doubled the snow blocks round the igloo to prevent it form being blown down by the gale that raged and howled round us all night from the south-east, and after a meal of raw frozen salmon, crawled into damp and frozen sleeping bags and tried to forget our misery in sleep. But the furious gusts opened up cracks in the igloo and draughts of cold air swept over us all night.

Arctic worries.—No one who has not had the actual experience of travelling with Eskimos, living on their fare of raw, frozen seal or walrus and depending entirely upon his skill with rifle and harpoon to provide food and fuel for men and dogs, can form any idea of the mental worry and ceaseless anxiety to which the winter traveller in the Arctic is constantly exposed. Shall we be able to kill a seal or caribou tomorrow or otherwise we all starve? Will the dogs go mad from hunger and rush upon us like a mob of crazy wolves? Will the ice be too rough or too thin for us to pass over? Will a tidal crack open up and keep us here till we starve and freeze to death? Can we pass over those loose, treacherous, moving ice-pans, or shall we, men, dogs and sleds fall through the treacherous young ice and be sucked under the ice-floes and drowned by the racing tides? Shall we find snow with which to build an igloo at the end of a long weary day's march or be compelled to camp out, without fire or shelter, in the bitter north-wind? Will our scanty store of seal meat and blubber hold out until we can kill another seal? Will our dogs, hungry and lean, which have not eaten for the last five days, be able to last for another day until we can kill something, or will they die and leave us stranded in a desolate region of snow, ice and tempest, to perish slowly of cold and hunger? Shall we, as so often has happened to the Eskimos, after finishing the dead carcases of the frozen dogs, be compelled to live on the dead bodies of our companions, and then slowly perish? Will our cartridges hold out? Will the wind suddenly change and drive the ice-pan over which we are travelling, out to sea and destruction? Will this fog never lift and show us our direction? Will the sun never shine again? Are we driving straight for open water and a miserable death in this land of interminable fog and darkness? Will we ever get back to warmth, confort and freedom from constant suffering, frostbite, hunger, thirst and misery? There are some of the life and death questions that constantly haunt the mind of the traveller in the Arctic. Sometimes the strain is over-great and men like the dogs, go mad and perish.

Tremblay Point.—April 2rd.—Yesterday's south-east gale with driving snow continued this morning and the dogs objectd strenously to being harnessed in such a storm. We started neverthelless, soon after daybreak and followed the shore in the south-easterly direction until we reached Cape Hallowell and Tremblay Point, which I climbed and where I took some samples from the quartz veins that cross it in all directions, and which vary from one inch to a foot in thikness.

Soon after we reached Tremblay Point the storm abated, the wind fall and a bright sun shone out, giving me a splendid view of Fury & Hecla strait and the southern shoreline. From the point I could see the rough masses of heavy, ancient Arctic ice-floes, all crushed and pilled up on the shores; so I made out into the middle of the strait, at the western entrance, where the ice-floes appeared smoother, but which were much rougher and harder to pass over them than they looked from the point.

Fury & Hecla Strait.—Fury & Hecla Strait which runs almost due east and west just south of the seventieth parallel, is ninety miles long and varies in width from eight to 20 miles. Its western entrance, between Tremblay Point and Cape Inglefield is about 12 to 13 miles across, which is reduced by a couple of Islands that lie north of the latter, cape. The straits narrow in towards the east, until south of Ormond island the channel is only about four miles wide. The heavy Arctic floes often several miles in length and breadth and from 20 to 30 feet in thickness, that drift in from the gulf of Boothia and Prince Regent Inlet, are driven eastwards by the strong prevailing current and become solidly jammed between Ormond and Elder islands and the mainland, where they remain winter and summer, drifting east and west alternately with the change of tide, and north and south, with the varying winds, thus effectually blocking the straits as a channel of communication for ships between Fox Channel and the Gulf of Boothia. The soundings made by Parry in 1822 at the eastern end of the strait showed only thirty fathoms of water between Ormond island and the south shore, so that a large iceberg, standing only 30 feet high above the water, could not pass through into Fox Channel, but would ground and remain for an indefinite period in the strait.

For these reason Fury & Hecla strait will never become a practicable route for ships, as navigation is only possible, under the ever-present risk of being crushed and sunk through being caught between the heavy ice-pans jammed together with irresistible force by the swift currents and strong winds from September 20th to October 15th. In some years the passage is never open, except for a few leads between the pans along the shore, and only the strongest ship with powerful engines would have a chance of squeezing through, without being beset or crushed between the floes.

Leaving Tremblay Point we travelled well out into the middle of the strait and as the weather was now fine and bright I had a good view of the southern shore, as we coasted along the east for about 20 miles.

In Parry's map there appear five small islands, north and west of Cape Inglefield, but I had a good view at short range of this point and could only make out two islands in that vicinity.—One island which I named Alfred Island, is situated about two miles from the southern shore as the western end of the strait and bearing due south from Tremblay Point on the north shore. Alfred island is about 3½ miles long by 2 miles wide. The second island is smaller and lies about 3 miles west of Alfred island and five or six miles north-west of Cape Inglefield.

The south shore of Fury & Hecla strait is formed or sloping, rounded hills, cut by small valleys which gradually attain a height of 1000 feet and consist of rusty, black rock, identical with the rocks of the north shore. The strait appears to have been opened or thrust apart by a sudden crack or cleavage of the earth's crust.

Amherst and Liddon islands.—Amherst island and Liddon island, as presented on existing maps, are far too big and are misplaced; they are not in the middle of the strait, but lie close to the southern shore, about a mile off shore and are distant respectively about 25 and 17 miles from Pelletier Point at the eastern entrance. These islands lie east and west and are about 4 or 5 miles long and from one and a half to two miles wide. They are about two miles apart. Opposite to Amherst island the strait is fully 12 miles wide, while in the existing charts it appears as being only about 4 miles wide. There is no large bay as represented to the south and south-east of Amhesrt island, but the coast runs generally almost straight, by gentle and easy curves to Pelletier Point, which, moreover, does not consist of a long narrow island, with a small islet between it, and the mainland, as represented, but is a long narrow neck of land which juts out, due east, from the shore.

Amberst Island.—Parry writes:—"The appearance of Amherst island is remarkable on account of the materials of which it is composed (which differed geologically from any hitherto met with) and from its singularly dark aspect which contrasted strangely with the surrounding lands. The snow always first dissolved upon this island. which, even on some very cold days, contrived to throw off its fleecy mantle when no other shore was uncovered—which circumstance may perhaps be in part attributed to the colour as well as to other qualities of the rocks. Captain Lyon reported the flat beach and the whole northern side of the island was covered with minute scale of black slate—and suggested that coal, although no signs of it were discovered, might be found a few feet underneath the surface. The southern half on the island was covered with small amorphone masses of clay and limestone and some low swampy places were thinly clothed with shrivelled grass and moss; while on the northern slaty side we could perceive no sings of vegetation. The base of Amherst island is argillaceous or graywacke schist. The more elevated ridges of the island are formed of the disintegrating remains of a super-incumbent stratum of hard, compact limestone of a dark greyish blue colour; externally, where exposed to air or moisture deeply ferriginous.—It does not burn into quicklime but contains minute veins of calc-spar and corresponds with the calc of Kirwan. Worm blocks of sandstone, granite, gneiss and other quartzose rocks are scattered over the surface of the island."

A beautiful grotto.—Captain Lyon reported on Amherst island in September 1823:—"Near the place at which Mr Ross was stationed to observe the tides I found a most fairy-like grotto in a small cliff of black and rugged slate, through which the water as it oozed had formed icy stalactites, five or six feet in length. These hung across the front of the cave in a variety of fanciful forms over a small basin which was frozen as smooth as the most polished mirror. The sun shone full but powerless on the silvery icicles which formed a brilliant contrast to the deep ebon shade of the cave behind them. The whole appearance of this little spot was of the most delicate and novel description, and I felt that neither by pen nor pencil could I do it justice."

"Liddon Island is formed of coarse, whitish sandstone and Ormond of gneiss.

We camped that night in the middle of Fury & Hecla strait, finding good snow for our igloo.

April 3rd.—A clear, bright day with a cold south-east wind blowing. We travelled along the centre of the strait, within five miles of the southern shore, the character of which I studdied carefully as we passed. For the first ten miles we travelled over very bad, rough, old Arctic ice, and after that over rounded hillocks of polished ice on the top of the old Arctic pans over which the dogs travelled fast. We covered over fifty miles during the day, and crossed the strait from the west end of Liddon island to the north shore to the igloo that we had built on March 27th, where I had left some seal meat and blubber. It was dark when we reached the north shore, and but for the keen scent of the dogs, should have passed the igloo in the dark. We saw fox tracks round the igloo, as the smell of the meat had attracted them.

That night was very cold and the igloo was full of holes from the heat of the stove and, consequently, very draughty. After eating some raw salmon, I fell asleep as I sat, in the igloo from sheer fatigue, and woke up, two or three hours later, chilled to the bone, when I crept shivering as with an ague, into my frozen sleeping bag.

April 4th.—We made an early start at daybreak, as I was determined to reach Igloolik without breaking the journey. The day was bright, intensely cold (about 40° below zero) and clear with a light south-easterly breeze blowing in our faces. Following the north shore along our old sled trial, which we had broken a week before, we reached the cache of seal meat which we had left near the water hole between Elder island and the shore. Here we fed the dogs, and that was no easy operation as, like famished wolves, they hovered round the seal and would every now and again dart in to secure a mouthful, and one had to keep fighting them off and to be careful at the same time not to hit them with the axe when chopping up the frozen carcase.

I then climbed the hill to get a view of the water-hole and to see if it contained any seal. As I saw many bobîng heads, Takkowah and I took our rifles and proceeded as near to the edge of the hole as was prudent, as the tide was rushing and roaring under the ice from the west at a great rate, and the small thin ice at the edge was continually being torn away in chunks and carried under the pan. The wind in the narrow channel between Elder island and the shore became very strong and blew cold on our faces like an ice-blast. The wind was too cold for the seals to stay up long and they would poke their noses out of the water only for one moment at a time, quickly empty and fill their lungs, and disappear. They were also timid and scarny from the fusillade I had treated them to the week before. I shot one with a quick snap shot from my Ross 280 at 80 yards and killed it instantly, but before we could get a harpoon into its body the swift tide had swept it away under the ice. Takkowah nearly fell into the water while trying to harpoon it, before it desappeared under the ice, as the thin ice kept breaking off from the edge. Once in it would have been all over with him in an instant as I could never have saved him. He would have been frozen and swept under the ice in a very short time. It was risky and anything but an enjoyable form of sport The cold wind filled my eyes with tears and nearly froze my fingers, so that, after two more shots at a couple of bobbing seal's noses, which I missed, I gave up and told Takkowah to go back for the sled. The cold wind was causing a dense black fog to rise from the surface of the open water.

Neertonatko Island.—We followed our old track for a while, and then bore away round the east end of Ormond island, when I got a good view of the dimensions of the large water hole to the south of that island. Passing round Pelletier Point, of which I took good note, we bore away south-east for Igloolik. By nightfall we were about five miles from the north-east point of Neertonatko Islands, when darkness came upon us. But I was determined not to stop and we travelled all night. We skirted the north end of Neertonatko island, which is a limestone island and so flat that it looks like a large ice-floe. The shore is however littered with crumpled ice-pans which caused us, in the dark, a great deal of trouble to pass over. The sled capsized a couple of times and the dogs' harness kept getting caught and breaking in the jagged blocks of ice. Several times the dogs fell into ice-cracks and broke their harness, when we had to haul them out and repair the harness. Takkowah kept falling asleep on the sled from fatigue, and I had continually to be shaking him to keep him awake in order to keep the dogs moving. I myself was almost done up with want of sleep, fatigue and hunger.

While passing along the north shore of Neetonatko, I came across tow sled tracks which, according to the dogs footprints, were travelling towards Igloolik. I recogni.ed the trail of Coonoo's sled and the footprints of his young son. I said to Takkowah "That is Coonoo's sled and may be Mr Wilson is with him", although I could see no traces of a white man's tracks in the snow. The sight cheered me up greately as it meant fresh provisions and more cartridges with which to kill game. I pressed on eagerly after that, in the direction of Igloolik.

We crossed the eastern end of Neertonatko island and then lost our way again in the dark and stumbled about in the rough ice all night, falling into cracks, pulling out the dogs, righting the sled which kept continually capsizing, until we nearly ran off the edge of the shore ice into the open water of Fox channel, which borders the island of Igloolik at a distance of about 8 miles from its eastern shore. I suddenly noticed that we were travelling over thin ice and woke up Takkowah who was fast asleep on the sled just in time and we altered our course to the westward in the direction of the land. We must have travelled in this way at least 15 miles in the dark more than was necessary and when we reached Igloolik had covered over 70 miles since leaving our last camp the morning before, without stopping to rest or eat.

Reach Igloolik.—As daylight broke, I recognised two icebergs which were grounded near the island and which I had previously remarked when hunting seal. Soon after that we struck the sled trail leading to Igloolik and reached the village about 10 a. m. on April 5th, after a 28 hours march.

I made straight for our igloo, where I found Peewiktoo and Tootillik, and was so tired and hungry that I fell asleep when trying to eat a small piece of frozen salmon. I slept for about 5 hours, and then ate some more frozen salmon and a biscuit that Tootillik cooked for me from a small bag of flour that Coonoo had brought from Ponds Inlet.

Shortly after, Coonoo, who had accompanied Wilson from Arctic Bay to Ponds Inlet, paid me a visit with Nookudla.

After a short rest, to show the whiteman, the possibility to return to his country on foot when his vessel is wreched in these glacial regions. I decided, no matter the risk, to journey home from Igloolik to Winnipeg, following the west shore of Fox Channel and Hudson Bay to Fullerton and thence to Churchill and overland to the railroad at Le Pas. But the natives were afraid to accompany me and having no stock of seal meat I was compelled to abandon the idea.—

I then asked the Eskimos of Igloolik to accompany me on a flying tour round the north and eastern shores of Fox Channel, which are still unexplored. I specially wished to make a survey of that coast as I believed it would provided valuable information of general interest. But the natives refused to accompany me.

I finally decided that I would make a flying trip to the great lakes on Melville Peninsula, as the natives had told me there where large quartz veins in that neighborhood, and then to return, without delay, overland to Ponds Inlet.

Had I been provided with a proper supply of provisions and cartridges I could within three weeks have easily explored the northern and eastern coasts of Fox Channel as far as the outlet of Lake Netilling and have returned overland across Cockburn Land to Ponds Inlet before the snow had disappeared. I could also have doubled my contribution of foxskins and bearskins to the coffers of the expedition.

Before starting for Melville Peninsula I spent 3 days at Igloolik recuparating from my Aggo trip and drying my wet clothes.

On April 6th.—I spent the day repairing an old single-barrel 450 Express, Martini-Henry action for Akkri-agro. The stock had broken in two across the narrow portion, and I fashioned two steel plates from a peice of steel sled runners, through which I had much trouble to drill holes for the screws; my only tool being a small file, which I used for a drill. This job occupied me all day, but when finished, it was stronger than when new and Akkri-agro was very grateful, as without his rifle, he was in bad shape to provide his family and dogs with seal meat. On April 7th.—I repaired and adjusted the sight of Coonoo's 303 Winchester carbine and spent the rest of the day making preparations for an early start for Melville Peninsula on the morrow. During these days the weather was clear, bright and intensely cold, with a strong northerly wind blowing.

CHAPTER IX

TREMBLAY'S JOURNEY TO MELVILLE PENINSULA

April 8th.—The morning broke fine and clear for our trip to Melville Peninsula. A bright warm sun was shining overhead and a gentle breze from the south softened the frost in the atmosphere. It was the first warm day that I had experienced since the previous September, and Takkowah and I started off from Igloolik in good spirits.

Trouble with Eskimos.—It was only by a ruse that I induced Takkowah to accompany me, and he was quite a boy and had not got over the hardship of our trip to Aggo. I pretended that I only wanted to explore the coastline in the direction of Hoppner inlet; to the west of Igloolik, and would be away only a couple of days. I knew that once we had left Igloolik he would go where ever I told him. Nookudla by his underground work and which was unknown to me at the time, had frightened the rest of the natives of Igloolik from accompanying me, and when I had broached the subject, they had raised all kinds of objection; saying that the ice was too rough, the season was getting late, that their supply of walrus meat was too small, etc., etc. It was a case of "where there's a will, there's a way", and they did not have the will, Coggan, Peewikto and Nookudla all wished to return to Ponds Inlet as they pretended that the snow would soon vanish from the hills and valleys of Cockburn Land which I knew would last until the end of May, They also told me that several bands of Eskimos had lost their lives when crossing the land, owing to their cartridges giving out and being in consequence unable to kill enough caribou for themselves and their dogs. So I took only the young Takkowah, under the pretence of making only a short flying trip for a couple of days. But I was secretly determined to visit the great lakes and country that lay 100 miles to the south, as the Eskimos had told me there were many veins of quartz in the rocks of that region.

Light Equipment.—We took 15 dogs and no load beyond enough walrus meat—which was rotten and stinking—to give the dogs a couple of meals; some seal oil for the blubber stove; some caribou, seal and walrus meat—the latter also putrid—and only enough to last Takkowah and myself a couple of days; and our sleeping bags, snow knives, harpoon and rifles.

I left Peewiktoo at Igloolik to trap foxes and to hunt seal and walrus in preparation for our return overland to Ponds Inlet.

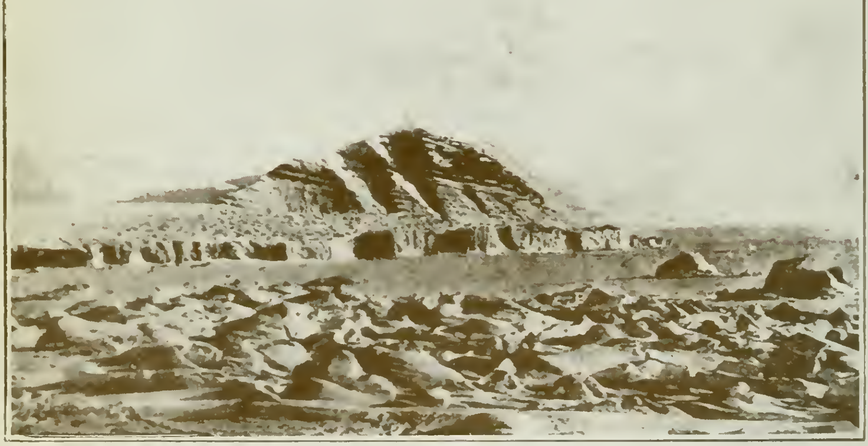
A beautiful day.—Shortly after we started the breeze fell to a dead calm and the warm sun began to melt the snow in the drifts and on the hills. The ice, which had been bare swept bare by the late gales, was as flat as a billiard table and glistened like a polished mirror in the sunlight. It was a delightful day and our large, strong team of fresh dogs raced along at full speed, drawing the light sled on the smooth ice at a great rate. We must have made at times, over ten miles an hour. Whenever the dogs would scent a seal hole in an ice crack, they would make a spurt in that direction, and on coming to the hole, would stop short, when Takkowah and I would have to check the sled with all our force to prevent it overrunning and hurting the dogs.

Fast travel.—In this way we travelled steadily at an average of six miles an hour for over ten hours when we slackened up a little, and then travelled for another four or five hours, and covered about 70 miles before we camped for the night. We averaged not less than five miles an hour during the whole trip, which lasted six days.

Hoppner Inlet.—On leaving Igloolik I took a westwardly course, as it was my first intention to proceed up the sound that terminates in the Crozier River, the natives having informed me of the existence of a large vein of quartz on the south shore of that sound. We continued in this direction about W. by S. of Igloolik, until the south wind sprang up again, the sky became black, and overcast, and some snow began to fall. Fearing bad weather and having so little food for the dogs, I abandonned the idea of continuing further in that direction, as I had already some samples of the quartz which the natives had given me. So after reaching Hoppner Inlet we turned round and ran eastward along the shore of the mainland for about thirty miles.

Quartz vein—Crozier river.—The quartz vein that the Eskimos mentioned as being on the south shore of Crozier sound is, according to their report, four feet in width and occurs as a high fissure vein that runs for a long distance in a south-westrely direction. It is highly mineralized with iron pyrites.

Islands.—During the morning I had a fine opportunity, in the clear atmosphere, of studying the character, bearing and formation of the islands and coasts line that lie to the west of Igloolik. The long point which, in Low's map, juts out into Fox Channel, due west of the island of Igloolik, is in realty, no peninsula at all, but consists of two large islands, separated from each



1—Hunting Polar Bear with dogs.
2—The foot of a glacier.

other and the mainland by well defined channels about a mile and a half wide. These islands which I named "A" and "B" are about 150 feet high, and are composed of the same rusty, brown-black rocks which, apart from the low-lying strip of limestone which lies along the eastern coast of Melville Peninsula, characterize the formation of Hecla & Fury strait, and the other islands with the exception the limestone islands of Igloolik and Neertonatko.

There are four other islands, lying to the south of these two large islands, which are formed of the same rock, and which I have marked, C, D, E and F, on the map.

Huronian rocks.—The black rusty-looking rocks which predominate in this region are cut by numerous small veins of quartz, which cross them in all directions and some of them contain quantities of iron and copper pyrites. I traced this formation for over 250 miles in length from the western shores of lakes Sarcpa and Taseonia in the south to 100 miles north of Murray Maxwell Bay, and just south of Milne inlet, in the north. This same class of rock, cut by numerous quartz veins, often contains pyrites of copper and iron sulphide, covers the north-westren section of Melville Peninsula, both shores of Fury & Hecla strait and crosses the southern portion of Brodeur Peninsula and again occurring in Borden Peninsula, from Moffet Bay to Strathcona Sound. This black rusty rock stops short about 30 miles from the southern end of Milne inlet, where it changes into the typical Laurentian gneisses and schists of the rocks of Ponds Inlet, Bylot island and Eclipse sound.

West of the large lakes of Sarcpa and Taseonia on Melville Peninsula this rock is displaced by decomposed mica-schist, granite and diabase, all cracked and interspersed by numerous veins of quartz and calcite, many of them impregnated with iron and copper pyrites and other minerals.

Geological formation.—Parry in 1822, when searching for the north-west passage explored the east-coast of Melville Peninsula from Frozen strait to Fury & Hecla strait and Dr Rae in 1847 explored the west coast of Melville Peninsula, from Rae Isthmus to Cape Crozier. The result of Parry's observations has been summarized by Dr Dawson as follows:—"The geological specimens brought back were examined by Prof Jameson, and detailed maps of the expedition include indications of the character of the rock at so many places, as to afford the means of tracing the geological outlines with very considerable accuracy. Granitic and gneissic rocks occupy the whole of the southern part of the east shore of Melville Peninsula, and are continued northward behind a low track of limestone country (along the north-eastern shore) forming a range of mountains in the centre of the peninsula to Fury & Hecla strait. They also form to the south shore of this strait, and most of the islands in it, and apparently the whole eastern shore of the adjacent south part of Cockburn "island".

"The rocks refered to above, in a general way, to the Archaean, probably include areas of Huronian. Jameson mentions as among the prominent varieties of rocks derived from this region," Granite, gneiss, mica-slate, clay-slate, chlorite-slate, primitive trap, serpentine, limestone and porphyry". In association with these the following minerals occur:—"Zircon, and heryl, also precious garnet, actinolite, tremolite, diallage, coccolite, rock crysral, calc-spar, rhomb-spar, asbestos, graphite or black-lead, specular iron-ore, magnetic iron-ore, chromic ore, or chromate of iron, titanic iron, common and magnetic iron pyrites". Some of the "transition rocks" noticed by Jameson should probably also be classed with the Archaean, and, in addition to several of the minerals above mentioned, in these were found tourmaline (schorl) and molybdenite."

Dr Bell writes:—"The intrusion of the granite appears to have greatly affected these clastic rocks, changing them into gneisses and schists, so that, for a considerable distance from the contract they resemble lithologically, the Grenville series of the Laurentian. The granites appear not only to have produced the schistosity, but to have caused infiltration of heated waters carrying silicates in solution deposing large quantities of quartz and felspar between the laminae of the mica and hornblende-schists, changing these into typical gneisses, which, as well as the schists, usually carry large quantities of garnet, often in very large crystals. When associated with gabros, diabase and their decomposition-products, the bedded rocks are often ramified with quartz veins, generally holding considerable pyrite, these are most abundant near the contact with newer granite. Several samples from such veins have been asseyed for gold with negative results, but these can not be accepted as in any sense conclusive.

Referring to a similar formation on the east coast of Hudson bay, Mr Low, writes:—"The intrusion of granite into the large areas of basic rocks met with along the coast at intervals from Kovik river to the southward of East Main river and the foliation of those latter by pressure has caused a segregation of sulphides, always found scattered through the diabase, into long lenticular masses parallel to the foliation, and large veins of quartzose granite and pegmatite from the granites penatrating those basic rocks have also taken up some of their sulphides which may prove valuable ores. The area northward from Portland promontory to the vicinity of Mosquito bay appears to be the most promising for the discovery of sulphide ores in the form of pyrite, pyrrhotite and chalcopyrite as the diabases at that region have been greatly crushed and foliated and are also penetrated by many veins of quartz."

Huronian belt.—From the foregoing and taking into account Tyrrells' description of the Huronian rocks which he found south of Chesterfield inlet, quoted in chapter XIII of this volume, it would appear that a broad band of Huronian rocks, consisting of dark-green eruptive rocks, chiefly diabases, often very much squeezed and altered into schistose diabases and gabbros, and mingled with micaceous rock, stretches from Dawson inlet on the west coast of Hudson bay, on the south-west, through Melville Peninsula, Cockburn Land, Brodeur and Borden peninsulas to Cadogan inlet (Ellesmere land) and Inglefield Gulf (Greenland) in the neighbourhood of Smith Sound on the north east. This broad of Huronian rock which is roughly 150 miles wide and 1250 miles long occurs between extensive beds of limestones and Archaean Granite-Gneisses, and is cut in many places by numerous veins of white quartz, highly charged with iron and copper-pyrites, notably at the head of Tremblay Sound and Ka-joo-ark-to island (Eclipse Sound); Arctic bay, Adams and Strathcona Sounds in Admiralty Sound; in the centre of Caribou Valley and around Quartz lake (Cockburn land); in the vicinity of Tremblay Point and Autridge bay (Fury & Hecla strait); between Hoppner inlet and the Crozier river (north Melville Peninsula to the west of Lakes Sarcpa and Tasonia in the Connaught Mountains (Melville Peninsula) and on the west coast of Hudson bay, between a point 45 miles north of Cape Esquimaux and Baker's Foreland.

Limestone country.—We journeyed along the coast, about 4 miles from the shore, over fine smooth ice and passed across the mouth of the wide shallow bay that lies to the south-west of Igloolik. The rock was of the same character until we reached the eastern side of the bay, when the country changed to a series of low, rounded hills of gravel and sand, superimposed by flat beds of limestone and covered with short stunted grass which showed up through the scanty snow covering. This formation continued out to the shore near Cape Arlagnuk. About seven or eight miles from this latter point we turned inland and crossed over what seemed to be a good sized lake, which Takkowah informed me contained salmon. We then travelled for about fifteen miles in a south-westerly direction, across the land, which was very flat and covered with a thin covering of hard snow about a foot deep, through which I occasionnally caught glimses of grass and boulders. The dogs travelled easily and fast until we reached a bay situated at the entrance of a sound, which I named Foster

Sound, in honor of the Canadian Minister of trade and Commerce, and about ten miles south of Arlagnuk Point.

As we had travelled some 70 miles since leaving Igloolik without stopping to eat or rest, and the dogs were tired, I decided to camp here for the night until daylight should break and enable us to proceed. When looking around for suitable snow with which to build our igloo, I walked over a very deep snow drift which sounded hollow under my feet On examination I found that I was walking on top of an old igloo which had been buried deep in snow by the recent gales and which had been built by a couple of Eskimos on their way down to east coast of Melville Peninsula to Captain Comer s trading station at Aivillig near Wager nlet, and about 400 miles south of Igloolik.

On breaking into the igloo I found it to be large, roomy and clean, and was greatly relieved at not being compelled to build a new one, as we were both fatigued with the long day s march, without stopping for rest or food. The building of a new igloo out of snow blocks, an operation which takes about an hour and a half of hard and unpleasant work, at the end of every day's march in the Arctic, becomes very tedious and is a great burden to tired and hungry men after the long day's journey.

We were so tired from the long day's work, during which we had hard work to keep the large and unruly team of dogs on the course and to prevent them from continually chasing after seal-holes, that, after bolding some caribou and seal meat hastily warmed on the seal stove, we fell asleep in our clothes. The stove soon went out and the temperature of the igloo resembled that of an ice-house.

Just before turning in, I found an unfortunate fox with its leg broken struggling in a trap that had been left there by the Eskimos, and I killed the poor animal to save it from furthur pain and buried it under a snow mound and re-set the trap, which was a hard and cruelly cold operation.

Parry's flagstaff and record.—Half-way between Arlagnuk and Mogg Bay, Parry, before leaving Igloolik in August 1823 erected of flagstaff 56 feet in height, having at its top a ball made of iron hoops and canvas, ten feet in diameter, and buried a cylinder near its foot, containing a parchment with an account of his visit to this region. In addition to this record Parry left at Igloolik all his sledges an old boat and a quantity of wood of convenient size for bows, spears and paddless and the ice-anchor which I found. The natives mentioned the boat to me, but no signs of the flagstaff were visible when I crossed the land near the spot where it was erected and as I had, unfortunately, no knowledge at the time of the fact or the place that he had left such a record, I made no effort to find it.

Foster Bay.—April 9th.—We remained in the igloo three or four hours and resumed our journey southward about an hour before the sun rose over the horizon. We journeyed due south for about ten miles over smooth, polished ice along the western shore of a large bay. This bay lies north and south, between Cape Pingitkalik and the entrance of what I named Foster Sound The distance between these two points is about 13 miles, and its greatest extension, north-west to south-east is about 15 miles. The mouth facing east on Fox Channel is about 13 miles wide, and soundings taken by Parry showed 16 fathoms of water ten miles from the shore. From Cape Arlagnuk south to the 68th parallel, an extension of 100 miles, the coast consists of flat, low-lying limestone country with a very shallow shore, which gives soundings of only 10 to 13 fathoms five to ten miles out. Ten miles south of Cape Amitioke, near 68th parallel the limestone comes to an end and the shoreline changes to Archaean rocks of granite and gneiss, and the water along the shore deepens to between ten to 50 fathoms as far south as Lyon inlet. at the entrance of which there are 105 fathoms.

Islands.—To the south-east of Cape Pingitkalik are five small islands, and I saw North Ooglit island lying about three miles north-east from the southern promontory at the entrance of Foster bay.

Foster Sound.—The shores of Foster bay consist of low sand-hills and from the centre of the south-western shore of the bay a long, narrow, shallow sound, about 20 miles long and 2½ miles wide, runs inland in a south-westerly direction through low sand and gravel hills, covered with short herbage. We reached the end of this sound (Foster) about 9 o'clock in the morning, and crossing a narrow strip of low land, about 2 miles wide, covered with boulders and black rocks, which were polished as if by glacial action, and reached a small bay on the eastern shore of a huge lake, which the natives call Taseonia.

Taseonia Lake.—Taseonia Lake resembles in shape a huge fish with its wide-open mouth to the north-east and its tail, to the south-west. It is about 45 miles long and 30 miles wide from east to west. The eastern shores are low and flat consisting of sand gravel hills; the western shore is composed of the black-brown rocks which characterize the island region. These hills rise 150 to 200 feet in altitude. At the mouth of the small bay near the head of Foster sound, is a small rocky island covered with gravel and sand, about a mile in diameter. In the centre of the lake, about 20 miles E. by S. from this bay, is a large rocky island, lying E. and W, shaped like a basking walrus, about 50 feet high, about 8 miles long and 3½ miles wide, which I named Walrus island. Distant from Walrus island about a mile, is another smaller island, about two miles in diameter, and lying due north of the centre of Walrus island, which I named Kite island, on account of its shape. A long arm of the lake stretches north-east parallel to Foster sound; the western side of the Lake stretches away, in an easy semi-circle, to the south-west; the eastern shore is broken by a series of irregular bays, separated by sharp, narrow points. To the south-east a long, rounded point, 8 miles long by five miles wide, juts out into the lake and consists of the same black-brown rock. The southern end of the lake terminates in a curved bay, running S. E. and N. W., about 12 miles long and 6 miles wide. The lake empties on the east side into the northern arm of what I have named Roche bay, after the Canadian Minister of the Interior, by a short wide stream which is not over a mile in length, with a not very rapid current and a depth of 6 feet. Roche Bay I had no time to visit, but the oldest Eskimo of Igloolik, who goes there to hunt every summer, gave me a good sketch and particulars of its outline and dimensions. Roche bay consists of three separate bays, separated by two long interior promontories, that run east and west, and the whole bay measures about 25 miles deep and wide from north to south. The bay is surrounded by a low limestone country, covered with low sand and gravel hills, and is apparantly very shallow. Cape Amitioke forms the promontory at the southern entrance of the bay. The shallow water along the shore is obstructed nearly all summer by the ice-floes that are swept down on that coast by the current that flows from Fury & Hecla strait.

Taseonia lake is a favorite fishing and hunting resort for the natives of Igloolik in the summer, as its waters abound in the largest kind of Arctic salmon, which the natives told me often exceed four feet in length, and freshwater seal, and its shores abound in Arctic fox, caribou, wolverine, wolf, Arctic hare, and migratory geese and waterfowl of many varieties. Walrus and seal are plentiful along the shores of Fox channel. Unfortunately this veritable sportman's paradise is almost inaccessible to vessels as the low coast is covered with ice-pans that are pushed up on the shallow coast by the strong northern current and the strong east winds that prevail in the summer months.

An ice ridge.—The ice of lake Taseonia was in excellent condition and we travelled fast until we came to a large upheaval in the middle, evidently caused by the ice surface having cracked and been pushed together by the force of the wind. This upheaval formed a ridge about 8 feet high and we had considerable trouble to push the sled across it. Fortunately there was a bank of hard packed snow piled up in drifts against it and over this we pulled the sled. We made a wide detour to the north shore to look for caribou and finding no tracks, turned south and made straigth for the large island in the middle. Passing along the eastern side of Kite island we passed between that island and the north shore of Walrus island, along the north shore of the large island and down the west shore of the lake for about 15 miles, when we camped on the frozen surface of the lake near the entrance of the southern bay. When passing along the shore of Walrus island, I saw a white fox running at some distance away. We had covered about 80 miles since the morning without stopping even to eat. We gave the dogs a good meal at this camp, as, since leaving Igloolik they had travelled about 150 miles in two days without eating.

April 10th.—A fine day, clear, warm sun and light breeze from the south. We started before daybreak and travelled fast down the southern bay for about seven miles, when we came to a river that runs into the west side of the bay. We ascended the frozen riverbed for about 3 miles. and then struck overland in a southerly direction over a number of small frozen lakes or ponds, where I saw a great number of fox tracks. The land here consisted of a succession of low, round hills, from 50 to 200 feet high and consisting of rusty black gneiss, granite and diabase, crossed in every direction by veins of quartz in which I could see no signs of mineral. I also noticed a number of veins of mica, mostly white that were associated with the gneiss. At one place about ten miles south of the river, I came on a three-foot vein of quartz that ran east and west, almost vertical, for a long distance inland through a fissure in the rusty rocks. I saw no mineral in this vein, from which I took several samples. I had some difficulty in examinig it, as the ground was covered with snow and the grass underneath grew thick over the surface. Here I left a record in a 280 Ross cartridge which I placed under a cairn of stones erected over the hole from where I obtained the samples. Some three miles furthur on from the top of a hill I came into view of a large lake that is called by the Eskimos Sarcpa. The lake lay about a mile away to the south, and lay east and west with an approximate length of 25 miles and a width of 8 miles. The lake was surrounded by rocky hills, about 300 feet high which increased in height to the westward. The hills were of black rock and granite the former predominating and I saw many large boulders scattered about, all cracked by the frost and polished as if by glacial action. These hills are traversed in all directions by numerous veins of quartz.

Sarcpa lake discharges through a considerable river,about 15 miles in length, into the centre arm of Roche bay, and was said by the Eskimos to abound in Arctic salmon. I saw a number of fox tracks all over this neighborhood and in the summertime the Eskimos told me it was frequented by large herds of caribou and that the innumerable small lakes and ponds that dotted the country were favorite breeding grounds of large flocks of geese, ducks and other fowl.

My original intention was to cross Melville Peninsula by following Sarcpa lake and the valleys that led through the mountains to the west coast, on the Gulf of Boothia, as the Igloolik natives had mentioned the existence of some quartz veins near the Prince of Wales island. But this meant travelling over an additional 200 miles and having no food for ourselves or our dogs I was compelled to relinquish the idea and to turn back for Igloolik.

Connaught Mountains.—The west coast of Melville Peninsula consists of a series of high mountains that run in chains, north and south as far as Fury & Hecla strait, ranging in height from 800 to 1000 feet, and are composed of granite, diabase, mica-schist and other rocks of the Huronian series. These hills I named the Connaught Mountains in honor of H. R. H. the Governor of Canada.

Barrow Falls.—Twelve miles south of Cape Penrhyn on the east coast of Melville Peninsula and about 75 miles south of Amitioke, Captain Parry discovered the magnificent falls of the Barrow River At the head of the fall, which is about two miles and a quarter from the river's mouth, the river is contracted to about 150 feet in breadth, the channel being hollowed out through a solid rock of gneiss. After falling about fifteen feet at an angle of 30º with a vertical line, the width of the stream is still narrowed to about40 yards, and then, as if mustering its whole force previous to its final descent, is precipitated in one vast continuous sheet of water almost perpendicular for 90 feet or more. The foot of the fall can be approached to within a few yards by the rocky ledges that fringe the basin. "The dashing of the water from such a height produced the usual accompaniment of a cloud of spray, broad columns of which were constantly forced up, like the successive rushes of smoke from a vast furnace, and on this, near the top, a vivid iris or rainbow was formed by the bright rays of an unclouded sun. The roaring of that magnificent mountain cataract amid this sublime scenery was deafening and at the foot of the fall the very rock seemed to suffer a concussion under our feet. The basin that received the water at the foot of the fall is nearly of a circular form, and about four hundred yards in diameter, being rather wider than the river immediately below it."

"After remaining nearly an hour, fixed as it were to the spot by the novelty and magnificence of the scene before us, we continued our walk upwards along the banks; and after passing two smaller cataracts, found the river again increased in width to above two hundred yards, winding in the most romantic manner imaginable among the hills, and pursuing a smooth and unruffled surface of three or four miles that we traced to the south-west of the fall. What added extremely to the beauty of this picturesque river, which Captain Lyon and myself, named after our mutual friend, M. Barrow, Secretary of the Admiralty, was the richness of the vegetation on its banks, the enlivening brilliance of a cloudless sky, and the animation given to the scene by several rein-deer that were grazing beside the stream. Our sportsmen were fortunate in obtaining four of these animals; but we had no success with the seines, the ground proving altogether too rocky to use them with advantage and safety. The eider-ducks were here tolerably numerous, and we also met with some black-throated divers, golden plovers and snow-buntings."

"The entrance of this river lies in latitude 67° 18′ 05″ and in longitude, by chronometer, 81° 25′ 20″. We found at half tide from ten to twelve feet of water in mid-channel, for a mile above the first shallows, and it then quickly deepens to as many fathoms."

"The mineralogical character of this part of the coast is composed of greyish gneiss with fragments of granite quartz, mica-slate, some iron-pyrites and most of the other substances observed at Winter Island, (called by the Eskimos Neiyuning Eitva) lying scattered on the surface. Many of the stones found in the streams were coated with a thin crust of the oxide of iron."

Vegetation.—"There was no absolute want of vegetation; many considerable patches occurring entirely covered with moss, grass and other plants; but the whole of these were in a remarkably backward state, the saxifraga oppositifolia being, I believe the only one as yet in flower (July 13th 1822). The andromeda tetragona was here very abundant, and numerous tufts of sorrel were just putting forth their first red leaves. Other specimens included the potentilla nivea, saxifraga caespitosa, draba alpina and oxytropis arctica. In that year the first flower of the saxifraga oppositifolia was remarked on June 9th *one day later* than it had its appearance at Melville island in 1820."

Bad weather comes on.—Turning the sled round we retraced our route reaching lake Taseonia a few miles south of the river that we had ascended in the morning. Crossing the bay diagonally in a northwest direction we coasted round the large promontory that forms the east side of the southern bay and then continued up the centre of the lake to the east end of Walrus island. As we entered upon the vast expanse of the lake a cold northeast wind began to blow in our faces and by the time we had reached the island it had increased to a gale, accompanied by driving snow and sleet. So strong was the wind that we could hardly face it and the dogs kept sidling away to the east. The sky became so black and the snow fell so thick that we could hardly see twenty feet in front of us. After working our way against the storm and biting wind we ran into the long ridge of piled ice about eight miles east of the island and I decided to build an igloo from the snow drift under the lee of the ridge as a refuge from the raging elements, as the dogs were completely worn out and could not make further head way against the gale. We had covered at least 65 miles that day and had hard work to pull the sled over the hills near Lake Sarcpa. Building the igloo was terribly cold and trying work and when cutting and handling the heavy snow blocks I froze my nose and cheeks badly. I rubbed them plentifully with snow to restore the circulation. but so badly were they frost-burnt that water formes underneath the skin and my face was swollen for a long time after. My nose froze frequently during the trip from facing the bitter north winds and caused me a good deal of trouble and inconvenience.

It was terribly cold in the igloo all that night and every minute I thought the furious gale that raged outside would blow it down on top of us and that would have ended us, as each snow block weighed over 100 lbs. We had no fire as our supply of seal oil was finished. That night we ate the last remnants of our seal and rotten walrus. Our meat for the dogs was finished and 'we still had some 80 miles to cover before we could reach Igloolik, not allowing any extra mileage for deviation en route. To make matters worst we had to face a north-east gale that swept down on us with cyclonic fury from the icy north, accompanied by a blinding snow-storm that obliterated the landscape and enveloped everything in thin clouds of dense black ice-cold vapour that rose from the open waters of Fox Channel. Our position was not an enviable one.

Travelling in a blizzard.—April 11th.—The next morning the gale continued to rage with even more violence and Takkowah was afraid and wished to remain under shelter in the igloo. But I told him that we had no alternative if we remained we should surely die of hunger and cold and that we must face the blizzard and reach Igloolik in the next 24 hours or die, as we had neither food nor fuel to keep us alive. So we harnessed up the shivering dogs exposed to the bitter blasts of wind and snow, with no food in our stomachs, our faces, hands and feet numbed with the intense cold, and started in the teeth of the storm on the most dangerous and painful 36 hours journey that I had yet undertaken.

We fought our way slowly over the lake in a northeasterly direction our only being the wind that pierced us to the marrow with its pitiless blasts, and the air was so black with vapour and filled with drivimg snow we could scarcely see the leading dogs. We struggled on till we hit the flat, narrow portage, leading into Foster Sound, down which the icy wind pelted as through a funnel. The dogs at times would absolutely refuse to face the storm and we were kept constantly busy lashing them with the 40 foot whip to keep them moving. So strong was the wind that the lash would be blown back in our faces and we were compelled to run ahead and beat them with the butt. Once Takkowah in his efforts to use the whip, brought the end of the lash across my face and it raised a great welt across my cheek, that burnt like fire. The pain was so great it nearly made me sick. We could only keep our course by hugging the northwest shore of the long narrow sound and, when we struck the large bay to the north, by following along its western shore. I shall never forget the pain, misery and despair of that day while I live, nor the utter bleakness, desolation and black, stormy violence that was all around us.

At last we reached the old igloo that we had used for our camp the first night after living Igloolik, and here Takkowah wanted to stop for the night, but I said. "If we stop, we shall surely die let us go on!" So we pushed on all night without food or rest for 24 hours and fighting the pitiless blizzard every inch of the way. Before leaving the igloo, I tried in vain to find the fox I had buried in the snow, as I wished to take it to the owner, but could not find it. I first thought of returning the same way as we had come, as I did not relish the idea of rounding Capes Pingit-Kalik and Arlagnuk in such a storm, as the ice-pressure on the shore would be terrific, the ice was sure to be rough and there was the additional danger of our losing the land in the dark and wandering off the ice into the waters of Fox Channel. But our old sled track was completely obliterated and fearing to lose our way on the land, which was low and featureless, in the dense blackness of the night, we kept on round the coast round Pingitkolik and Arlagnuk, which consist of low rounded hills, of sand and gravel, nowhere rising above 50 feet in height.

Here we came into the full force and fury of the storm which swooped down on us out of the blackness of the night like a fiend in anger, and we blundered through miles of ice that had been crumpled and piled up on the shore by the violence of the storm. Tornarsuk was out in deadly earnest that night and we felt the power of his wrath. We hugged the shore as much as possible until we reached the point, as it was our only guide and safety. If the wind had suddenly shifted without warning to the northwest, as it so often does in the far-north, the pans over wihch we passed would have been disrupted and driven out to sea, and we should have surely perished. One Eskimo from Igloolik who went out on the pans over which we passed to hunt walrus, nearly lost his life in this way, as the wind suddenly changed and he had just time to loose his dogs and jump back on the shore ice before the slowly opening crack became too wide to jump across and his sledge, which he abandoned, was carried away to sea.

We struggled on, through the night, falling in the dark over blocks and pressure ridges of the ice, in which the dog traces kept continually catching and over which the sled would careen, bump and slide in all directions, often turning clear over and requiring to be righted, All this time the storm, sleet and snow pelted down on us with icy fury.

When we passed Cape Arlagnuk we had no land to guide us, but the ice became smoother as we left the coast. Takkowah was completely fagged out from cold, hunger and exhaustion and kept falling asleep on the sled, and I several times nearly had to use the whip on him to keep him awake and the tired dogs moving. The dogs were almost finished and some of the the best and hardiest would keep falling in the traces from sheer weaknes and fatigue. I kept shouting at Takkowah to keep to the left, telling him that if he allowed the dogs to run into the wind or away from it to the east we should strike the thin edge of the shore ice and then go through into the water. I kept calling to him that Iglôolik bay was to the left, but so stupid was he with cold and fatigue that he would dose off and allow the dogs to run into the teeth of the gale. Another risk we ran was of running full till in the dark on to a seal or walrus hole. These holes they keep open all winter by the warmth of their breath and bodies and by the strength of their skulls and flippers. These holes are covered with the thinnest of ice, as the animals are always breaking them open at short intervals, when they come up to breathe and never allow the new ice to form too thickly. The thin ice is covered with a thin coating of snow which renders it impossible to detect them in the daytime, at night, of course, it is out of the question. I nearly fell into one of these holes, a few weeks before, when hunting walrus near Igloolik. One foot went through and I only saved myself by throwing myself backwards, at full length, on the firmer ice.

The dogs on this night particularly, impelled as they were by the insatiable pangs of hunger, whenever they would scent a seal or walrus hole, would dash madly in the direction of the promise of food, and we had the greatest difficulty, using voice and lash, to stop them before they plunged us all through the thin ice-covering into the black and icy waters. Five minutes immersion in such weather would have settled us, half-starved exhausted and frozen as we were.

Once when hunting with a band of Eskimos near Cape Crawford on Lancaster strait in 1911, I nearly had such an experience. The dogs smelt a seal from a nearby hole and dashes off in its direction. We did all we could by clinging on to the sled and digging our feet into the snow to check them; but the 15 dogs, strong, keen and furious with hunger swept on at top speed, regardless of our puny efforts and plunged out on the thin ice that surrounded the open water hole. The ice began to bend and buckle under the weight of their pounding feet and of the sled with us seated upon it. I shouted to the Eskimos and we all jumped off-thinking it better to let the dogs perish than lose our own lives. The dogs finding the ice breaking under them, becamed frightened and we had the greatest difficulty and ran a good deal of risk before we got them and the sled back safely on the solid ice.

During all this night I had this danger constantly in mind of running full tilt in the dark on to the brittle ice-covering of a seal-hole and of going through.

In spite of me Takkowah would collapse into sleep on the sled and allow the dogs to follow their own course, and they, instead of keeping to the left, made for the open water.

At daybreak, as luck would have it, I felt that the sled was travelling over thin ice and peering ahead through the semi-light of dawn saw that we were heading at full speed for the open water, not 300 yards away and from which a dense cloud of black vapour was rising like steam. I shouted to Takkowah, who seemed quite oblivious of the danger, to stop the dogs, which, waking up, he did just in time. Another few minutes and we should all, men, dogs and sled, have been through the ice into the black icy depths and all would soon have been over.

I was so mad with rage, cold, want of sleep, hunger, fatigue and desperation that I nearly fell upon Takkowah with my fists, but keeping a tight rein on myself and remenbering all that he had come through in the long, heartbraeking hours of that dreadful night, I contented myself with giving him a good tongue-lashing instead and, turning the sled round in the opposite direction, made a westerly course where I supposed Igloolik lay.

Many times during the blackness of that hideous night, when one danger would be averted only to be succeeded by another, and then another, with the freezing wind howling and the snow-drift whirling all round us, with nothing but the merest guesswork as to the direction of the wind for a guide, faint with hunger and fatigue, battered to the ground by the force of the gale, shivering with cold to the very marrow, I would say to myself, "This is the end! But I never lost courage and was determined to plod on the end as long as I could keep on my feet.

Reach Igloolik.—April 12th.—We travelled all the next day, ziz-zagging about on the ice, utterly lost in the storm and the dense, black vapour clouds that rose from the open water near by, with the sled capsizing every now and again, and the dogs falling and stumbling from weakness, until at last we hit on a sledge trail that led us to Igloolik, where we arrived about 5 o'clock in the afternoon, wet through, hungry and nearly frozen to the bone.

I made straight for Peewiktoo and Tootillik's igloo and they were enjoyed to see me, as they and the other natives had given us up for dead, knowing how little food and fuel we had taken with us, and they thought it was impossible that we could find over way back in such storm and darkness.

We had covered nearly ninety miles in the last 30 hours, in the height of the worst storm of the year without rest or nourrishment.

The Eskimo dogs.—The dogs had eaten nothing since 3 days and the poor, dumb brutes, whose only lot during the greater part of the year is the lash, perpetual semi-starvation and the drawing of heartbreaking loads, had drawn the sled over 150 miles in that time.

These Eskimo dogs are magnificent animals and without their aid travel would be impossible in these regions. Other dogs may be able to travel as fast and as far, when fully fed; but there is no dog in the world than can work so long in the lowest temperatures on practically nothing to eat. There is only one breed of Eskimo dogs, but they are of all colours. Some say that they are the direct descendants of the Arctic wolf, yet they are, generally speaking, as affectionate and obedient to their masters as our own dog at home. Their food is meat and any offal they can pick up. For water they eat snow and I have seen them drink the sea-water in the summer. They are very strong and great swimmers and live outside in the coldest weather. The puppies when only a few weeks old can be seen toddling, like a perambulating ball of fur, after the sleigh.

With a decent daily ration of pemmican or tallow and cornmeal these Eskimo dogs would do better work, be able to pull heavier loads and last much longer.

Tootillik gave me some half-cooked musky biscuits that she made from flour, water and baking powder and I devoured them with some raw salt pork with the greatest relish, so ravenous was I for food of any kind. Then, wet clothes and all, I crept into my frozen sleeping bag, and fell straight away, into the deepest slumber of sheer exhaustion. But even then I was not allowed to sleep undisturbed as the natives fully aware of the miraculous escape we had had, kept crowding into the igloo to satisfy their curiosity and ask all about it.

Takkowah and I had covered over 300 miles in five days, resting only a few hours each night, with nothing to eat during the last 48 hours and the dogs had but two meals during the whole trip, eating nothing during the last three days.

During the next two days April 13th and 14th, the north-east gale continued to blow with the same violence accompanied by heavy driving snow and dense black fogs, and the temperature was about 20° to 30° below zero, at Salmon River some 250 miles to the N. E. in a direct line the temperature ranged between five above and the weather was bright, clear and calm with a light southerly or southwesterly breeze blowing.

The next few days I spent in skinning foxes, drying sealskins and chopping walrus tusks out of the frozen skulls with an axe which is anything but an easy operation, and the axe suffered considerably in the process. I afterwards scraped and cleaned the tusks, and made all preparations for our start on the long overland journey across Cockburn land to Ponds Inlet, the moment the gale abated. On April 13th, the wife of Takkowah's father Ee-took-sard-jooa, died of consumption and was buried on the land, a few stones being piled over the body to prevent it from being eaten by the dogs and foxes.

Tootillik's aunt, Coodloo, a bright, hardworking little widow and the mother of 15 children of whom two only were living, made me some caribou socks and dried my sleeping bag and wet clothes.

Poverty of Eskimos.—The squalor, gloom and poverty of the Igloolik natives during this winter was beyond description. They had scarcely any walrus or seal meat in their caches and the men were compelled to go out every day in the storm and obscurity to hunt walrus and big seal (oogjook) on the edge of the ice at the open water. A dangerous, painful and often desperate occupation. But they had to do it or starve and there were a hundred starving, wolf-like dogs to feed besides.

On one of these days Coonoo, with some more natives shot a young walrus on the edge of the ice and when running forward to plunge the harpoon into the wounded animal before it plunged into the sea, the ice gave way and Coonoo fell into the water. The other Eskimos threw him a harpoon line, which he caught and they pulled him out on the ice. He stripped off his wet clothes before they had time to freeze and the other Eskimos took off their outer clothes and put them on the shivering and semi-frozen Coonoo, when all the party drove at full speed on their sleds to the village.

The little store of flour and meat that I received by Coonoo was almost finished, and with no seal or walrus meat on hand to feed ourselves and the dogs, the outlook was not very bright. All that lay between us and starvation was my trusty Ross and a few dozen cartridges with which to shoot seal on the ice and the flying caribou on the land.

Peewiktoo and I lifted the fox-traps and repaired the dogs harness and smeared the steel sled runners with seals' blood and then sprayed them with water which, freezing instantly, covered them with a thin coating of ice and which reduces the friction and weight of haulage by about 50%

April 14th, was the last day of the storm and the weather was very bad, the atmosphere being filled with clouds of dense black vapour and driving snow. It was so dark that one could not see 20 yards ahead. Peewikto returned with the rest of the traps and two foxes; and reported the loss from one of the traps of a large wolverene, as the spring was too weak to hold the strong brute. There are many wolverene round Igloolik and on Melville Peninsula and they are a source or constant trouble to the Eskimos, as they rob their caches of salmon and caribou meat.

The wolverene.—The wolverene (Glouton Arctique) resembles a young bear with a long tail, and belongs to the marten family. It is of a blackish-brown colour and is found throughout the north of Europe and Siberia. In America it extends from Arizona and New-Mexico to the borders of the Polar Ocean having been found as far north as Melville Island in the 75th parallel of latitude—Numerous fossil remains of this animal have been found in the Pleistocene deposit of Southern and Central Europe. The body of the animal attains a length of 3 to 3½ feet and its tail is about a foot in length. It has a curious rolling gait but is quick and active when in pursuit of its pray, on which it leaps and with a sweep of its powerful claws, cuts its throat. In the snow it leaves four deep holes as it leaps forward all four feet of the ground at the same time. Its senses of sight, smell and hearing are very keen, It is a good swimmer and takes to the water without hesitation. The wolverene lives on the flesh of all animals including the caribou, hares and lemming in the north and horses, cattle and sheep in the south.

The wolverene is very courageous, fierce, powerful and destructive and in captivity has been known to attack and defeat a Polar bear, also in captivity. It is also a great thief and will steal guns, knives, axes, traps and other implements which it will hide under ground. With its immensely powerful forepaws, armed with five steel-like claws, it can enter with ease any cache.

The wolverene is very cunning and intelligent, and is generally fat and well-fed when the wolves and other beasts of pray are thin and starving. It is the bête-noire of trappers, as it seems to take a delight in destroying their traps and in devouring the game caught therein, as well as the bait.

The female gives birth to four or five little ones in the month of May, and these she will nurture until the following winter, when they must shift for themselves. She will defend the young ones with the greatest courage and ferocity, even against man.

The skin of the wolverene is very warm, light, and fine and is much prized for the making of caps and bonnets in the Eskimo country. The fur is worth from $10.00 to $15.00 a skin.

CHAPTER X

TREMBLAY'S JOURNEY FROM IGLOOLIK TO PONDS INLET

Another dog-fight.—April 15th, 1913.—We rose early and spent several hours packing sleds and harnessing the dogs, that gave us a lot of trouble. The moment we left the igloo, the dogs, of which there about a hundred, that had very little to eat and were in consequence half-starved, rushed the igloo in search of something to eat. Once inside they would have soon have demolished and devoured every thing in a few moments, including our scanty provisions, harness, clothes and bedding. When I returned from the sled to get another load, I found the narrow passage-way, made of snow blocks in front of the smal doorway, filled and completly blocked by a tearing, growling, fighting and furious mass of tangled canines, all bent on forcing their way inside the igloo, which was already filled to overflowing. Knowing that Peewikto's little wife, Tootillik, was inside and fearing for her life, I fought my way inside with fistes and feet and nearly clubbed half-a-dozen of the desparate animals to death. In getting inside, I found the igloo packed with the rabid brutes and Tootillik crouching in a corner, crying with fright. I soon put the leaders hors de combat and clearing out the rest of the dogs put a couple of Eskimos on guard at the door, armed with whips and harpoons.

The gale had subsided during the night and it was not so cold, and by the middle of the day a bright sun was shining overhead.

Goodby to Igloolik.—After bidding goodbye to the natives of Igloolik and telling them that I hoped to come and see them again some day and bring them plenty of cartridges and tobacco, I started about 8 a. m. for Murray Maxwell bay, where we intended to kill some seal before starting on the 'hike' across Cockburn land to Milne Inlet.

Our party.—Our party then consisted of Peewikto, Tootillik and myself with one sled and thirteen dogs; Coggan, his wife, his little daughter, his son and his son's future wife, with another sled and nine dogs; old Ootootia of Igloolik, his wife, and young son with a third sled and seven dogs. Nookudla and his wife, Vonnie, joined us a couple of days later with a fourth sled and twelve dogs. The whole party, therefore, consisted of thirteen natives, myself, four sleds and 41 dogs. All the sleds were heavily laden with seal tents bedding, camp ustensils, big seal and walrus skins, foxskins, walrus tusks, etc., whilst Nookudla also carried along, Mr Elder's heavy gravestone and Coggan carried on his sled, Parry's old ice-anchor. The headstone and anchor each weighed about 150 lbs.

Small supplies.—When we started we had no meat for the dogs and the poor animals had had nothing to eat during the past two days, owing to the storm which prevented the natives from killing any walrus or seal. For our own consumption there was only enough food in the shape of some walrus and seal meat to provide us with one meal and a few pieces of blubber for the stoves, enough to cook one meal. When this was finished, we had to depend on our straight shooting, with the few cartridges remaining, to kill enough seal and caribou to feed ourselves and the dogs until we could reach Ponds inlet, four hundred miles away, without counting another hundred miles or so which we would have to cover when hunting; a journey that took us three weeks and a half to accomplish.

Fox Channel ice.—We travelled all day skirting along the shore ice that fringes the open water of Fox Channel, which lies some four miles east of Igloolik. Fox Channel remains open all the winter and is filled with large pans and masses of old ice which are driven about by the winds. Sometimes when an east-wind is blowing, the ice-pans will extend for many miles along the shore, at others, when the wind blows from opposite quarters, the ice will be driven away out of sight and only open water will be visible to the horizon. The fixed shore ice as a rule extends permanently during the winter for a distance of three or four miles from the coast, but is by no means a constant quantity, as great pans are continually being broken off by the rise and fall of the tide and carried out to sea by the heavy winds and swift currents.

Granite Island.—We travelled over fairly good ice all the morning and made for a small island that is about 40 miles from Igloolik to its north-east, and about seven miles from the southern entrance of Murray Maxwell bay. On this island, which is Poe Tern Island mentioned by Parry, were cached some walrus tusks, oogjook and seal skins, and foxskins which I had bought from Ee-valoard-jook of Igloolik. Tern island is about two miles in diameter and consist of granite, diabase, and rusty-brown-black rock, rising about 300 feet above the sea-level. After picking up the contents of the cache on the island, we followed a painful and winding course of about 15 miles, over very rough crumpled ice, which took us all night to negociate, before we reached the entrance of South Channel leading into Murray Maxwell bay.

Seal Point.—April 16th.—We reached the South Channel entrance to Murray Maxwell bay about 6 o'clock in the morning after having travelled nearly 60 miles in 22 hours, since leaving Igloolik, without stopping to rest or eat. We camped on the southwest point, which I named Seal Point, at the entrance to South Channel, close to a large open water-hole which is caused by the swift tides that rush in and out of Murray Maxwell bay, and which is frequented by numbers of seal in the winter time.

I was faint with hunger and fatigue and, after a scanty meal on the last remnants of seal meat, slept for several hours in a filthy old igloo which we found on the point, as I was too tired to build a new one.

While we slept there came an ominous groaning sound of breaking ice, the following tide having split the ice-floe on which we were camped, in two. A three-inch crack opened up right across the floor and continued through the roof and walls of the igloo, which fortunately did not collapse on top of us. The cold north wind rushed in through the opening and nearly froze us as we lay, too tired and sleepy to move in our wet clothes and sleeping-bag. Half of the floor sank several inches and we finished the night with our head lower than our feet. To further disturb our slumbers the starving dogs kept climbing, clambering and slipping all over the roof of the igloo in search of something to eat, and kept waking us up with the noise and fear that they would send the roof toppling down on top of us. Their weight and the shock of their feet kept shaking down large lumps of damp snow which covered us, as we lay, with a loose, wet blanket of snow which, penetrating our sleeping bags and down the back of our necks, added to our general discomfort and prevented us from getting the rest that we so badly needed.

The Seal hole.—About eleven o'clock, when the sun was high and the air somewhat warmer I reluctantly crawled out to hunt seal in the waterhole, as we had nothing to eat, for ourselves or the dogs, and no more seal blubber for the stove. I was so tired and week that I could hardly lift my feet and I nearly fell down every time they encountered a hollow in the ice or stumbled on a small ice-hummock. But it was a case of life or death—we had to shoot seal or die. So Peewikto and I took my 280 Ross and 45 Colt automatic and struggled to the waterhole, the southern end of which lay about 400 yards from the igloo. Coggan and old Ootootia were so fagged out we could not awake them up. The seal hole was about 2 miles long and 500 or 600 yards wide and ran up the centre of the narrow channel. Broken ice was piled in lumps and ridges all round the edge of the hole, from 6 to 15 feet high, and the current rushed under the ice like a mill-race.

Seal Hunting.—When we reached the hole, we saw many seal heads bobbing up and down as the animals came up for a moment to breathe and then dived again for shelter against the biting north-wind that swept, like an ice-draught, through the narrow channel. A heavy cloud of dark vapour hung over the hole caused by the condensation of the water coming in contact with the colder air, and we could not see far through it. I gave Peewiktoo my rifle and taking my Colt revolver we each took a side of the hole. Peewikto was lucky and killed five seals, all of which he managed to recover with his harpoon, as it was high water and the tide was nearly stationery He shot three more after the tide turned, but lost them all as the swift current swept them under the ice before he could get his harpoon into them. Shortly after I shot and killed three more seal in three consecutive shots with my Colt Automatic, one at 50 yards and the other two at 100 yards range, but, owing to the swift current that was running at the tine, lost them under the ice. I ran to the igloo to fetch Coggan to give me a hand to recover them with the harpoon, but by the time we reached the waterhole, their bodies had disappeared. Out of eleven seal that we had shot we only succeeded in recovering five. We took two of the seals to the igloo and after giving the starving dogs a meal and some blubber to the women for their stoves, ate some of the meat for ourselves.

In the afternoon we laid some fox-traps for about four miles west of Seal Point, and, on returning to camp, had another good meal of seal liver and meat and, after patching up the cracks in the igloo, turned in for the bed, completely tired out The night was fine with a light wind blowing from the north.

April 17th.—I went after seal in the morning with my Colt automatic, but the wind was too cold and they would just show their noses above the water and then be gone. They were also badly frightened, no doubt, by the noise of the firing and slaughter of the day before. I did not get even a chance to shoot, and had no cartridges to waste. After wandering around the water-hole all day I returned to the igloo and finished cleaning the walrus tusks. Peewikto, to whom I had given my 280 Ross, retured shortly after with four caribou, all in poor condition, which he had shot about five miles west of South Channel, on the south shore of Murray Maxwell bay. He had started very early in the morning, taking his dogs and sled, and shot them out of a herd of fifteen caribou. He slightly wounded four others, which escaped. The Eskimos seem to have a habit of slightly wounding the animals they chase and of then following them up till they drop. It seems hard for them to hit a vital spot at the start. This may be the fault of their old-fashioneded, high trajectory arms, but they all seemed surprised when I would drop a running deer instantly at 500 or 600 yards with my 280 Ross copper-tube bullets'

After feeding his dogs on the intestines, Peewikto brought the skins and dressed carcasses of the caribou back to camp, each of which gave us about 80 lbs of poor meat, as the deer were very thin and their flesh full of maggots. That night we had a good meal of caribou meat and passed a restful night.

Nookudla and his wife arrived from Igloolik on this day and accompanied our party overland as far as Milne inlet

Avoie also arrived with his wife, two boys, five dogs and a sled from Igloolik, as he had promised to accompany me to a point some 50 miles north of Murray Maxwell bay to show me the locality of some good-looking rocks, of which he had showed me some samples. He remained with us seven days and swelled our party to eighteen persons and forty-six dogs. Avoie during this time, killed two deer that gave us about 100 lbs of meat, which went into the general fund, but he did not kill any seal, although he shot one and lost it.

April 18th.—We built a new igloo as the old one was falling in pieces, as the crack in the ice grew wider. It was a very bad stormy day and a gale blew from the north east, the air being filled with snow drift and black fog from the water-hole. It was useless attempting to shoot any seal, as the dense black fog that hung over the water-hole prevented us from seeing them. So we lifted the fox-traps and re-laid them along the west side of South Channel. The rest of the day I spent in cleaning and drying fox-skins in the igloo.

April 19th—The weather cleared up somewhat and after visiting the fox-traps I went after seal at the water-hole, but they would not stop long enough above the water to give me a shot.

April 20th.—The weather improved and the wind dropping I tried once more for seal at the water-hole, but did not get a shot.

April 21st.—The weather was fine, but very cold with a cold north-east gale blowing and the water-hole was covered with a lack vap our-cloud. Accompanied by all the men, with the exception of Ootootia and Coggan who were away hunting caribou, I went to the waterhole after seal, as all the meat in camp was finished—and I had given Coggân and Ootootia a good supply before they started, counting on being able to kill some more seal. But owing to the bad weather, strong tides and dense fog that constantly obscured the waterhole, we were unable to kill any since they left.

We killed four seals that morning, but they were too far away for us to reach them with the harpoon, and we lost them. From constantly keeping my eye glued to the sight when waiting in the cold wind, to get a snapshot at seal's head when it bobbed up above the water for a momentary breathing spell, I nearly froze my right eye, and my sight was continually blurred by the stream of water that kept flowing from it and freezing on my face. For about ten days my eyesight was affected and my shooting ability was unpaired, as my eyeball seemed blurred all the time as with smoke and I missed several shots that we could ill-afford to lose, owing to the paucity of our cartridge supply.

A desperate position.—Our position was getting desperate and unless we could kill some more seal shortly we should all perish of starvation in a few days. It is true that we could have killed and eaten the dogs, and so have prolonged our existence for some days longer, but by doing that we would have removed our only chance of getting back to Ponds Inlet, and, in the end, the result would have been the same.

What with the pain and trouble of my shooting eye, the anxiety of knowing that if I was unable to shoot and recover any more seal the whole party would perish, I grew desperate and told the Eskimos that if we shot another seal I was going to jump in after it and pull it to the edge of the ice, so they could reach it with their harpoons and thus secure the meat that they were all so badly in need of. I hated to think of the unfortunate women and children slowly dying of starvation before my eyes. I knew that it probably meant a swift death either from being swept by the strong current under the ice or of being frozen in my wet clothes, even if they succeeded in pulling me out, the weather being about 30° below zero at that time. But I imagined that the loss of one was preferable to the loss of all, and that if I succeeded of rescuing the body of only one seal the Eskimos could live on it until the weather got better when they would be able to catch some more. The Eskimos all protested against it and said that it meant certain death and that they were afraid. But I was determined that when the next seal was shot, I would make the attempt. Fortunately for me, perhaps, we did not see another seal rise that day, and we all returned to camp, hungry, cold and tired, hoping against hope that we should be more fortunate tomorrow.

Trouble with the Eskimos.—A disagreable incident happened that night in the igloo which might have easily resulted in bloodshed, owing to the lies and underhanded work of Nookudla. Before leaving Igloolik I had paid Takkowah for his services when he accompanied me to Aggo and Melville Peninsula. The pay according to his own demand, was fifteen foxtraps which I gave him. When Coggan arrived at Igloolik he brought with him a new 303 Winchesterrifle, which he had purchased for 15 foxskins from Takkowah's father, Eetook-sard-jooa, wanted one like it, and having fiteen foxskins and some walrus tusks on hand, proposed sending Takkowah on a flying trip, with a light sled and strong team of dogs, overland to Ponds Inlet to bring him a similar rifle and some cartridges. I told him that he would get very few cartridges for the walrus tusks, I lent him four white foxskins and one blue foxskin, which double the value of a white fox, on the understanding that he should catch me six white foxes with which to repay the loan, and that I would wait for him for ten days at the entrance of Murray Maxwell bay, as I had to wait there to catch seal before undertaking the overland journey. This Eetook-sard-jooa agreed to; and Takkowah started off for Ponds Inlet to bring back the rifle and cartridges, taking with him a pencil note from myself to Captain Bernier, in which I asked the latter to deliver the goods to Takkowah.

Takkowah left Igloolik the day after we started and left my camp at Seal Point on April 17th, for Pond's Inlet.

Nookudla, on the evening of April 21st, came to my igloo and said he wanted to leave at once and follow Takkowah, and told me that he had a seal cache half-way across the land trial, and said that he wanted to start at once as he feared the snow would soon melt and render the land travel impossible. As he was the only Eskimo with me who knew the trail across Cockburn Land to Milne inlet, the others having been in the habit of going by way of Scheming and Admiralty Sound, I told him to wait and accompany us as our guide. I told him that I had promised to wait for Ee-too-ksard-jooa to bring me the six foxskins and that I needed those days for seal hunting. Noo-kud-la then told me that Ee-took-sard-jooa was not going to bring me the foxskins and had told him (Nookudla) that I was of no account, that only Captain Bernier was of any account and that he had no intention of following after me. When Nookudla told me this I became very angry, as I was sure that he was lying to me and if I had enough seal meat, would have forced him to return with me to Igloolik to confront Ee-took-sard-jooa. Had I done so there would assuredly have been a fight with a probable certainty of bloodshed. I told the Eskimos that a whiteman was not going to allow himself to be cheated after having done a kindness and said that unless one of them started immediatly to overtake Takkowah and bring me back the letter and the foxskins that I had given him, I would take them all back to Igloolik and confront Ee-took-sard-jooa, and get at the truth of the story.

At this they all got very alarmed and Nookudla became very pale. They begged me not to go back to Igloolik and said that Coggan who had returned that day would ride after Takkowah and bring back the foxskins. Coggan started that night leaving his load so as to travel light as Takkowah had a good start. We agree to divide up his load and bring it on with us.

As Coggan had reported that caribou were numerous on the north side of Murray Maxwell bay I decided to follow on the next morning and not to waste any more time or cartridges after the seal. During the afternoon I lifted the foxtraps and explored the country to the west of South Channel.

On May 9th, I met Takkowah in Milne inlet when returning from his mission and he assured me that his father, Ee-took-sard-jooa, had never spoken of me in the manner indicated by Noo-kud-la and that he intended to bring me the foxskins. Noo-kud-la fearing probably, that I might meet Takkowah on the road, had made a pretext the day before to fall behind on the excuse that he and his dogs were too tired to go any further. He then passed me and reached Ponds inlet ahead of me and went straight on to Button Point and so I had no opportunity, before sailing for home, of giving him a lesson. But from the moment that Nookudla arrived at Igloolik I had trouble with the natives, who from being willing and anxious to accompany me and assist me in every way, suddenly became sullen and suspicious, and refused to accompany or to help me in any way.

Explorations.—During the time I spent at Seal Point I spent a good deal of the time exploring the adjacent coastline and the large triangular shaped island which forms the southeastern shore of Murray Maxwell bay. I named this island,Hazen Island, in honour of the Canadian Minister of Marine and Fisheries. Hazen island is about 40 miles long from east to west and eighteen miles wide from north to south, being widest at its eastern end. The southern part consists of granite, diabase and a blackish-brown rock. I had no time to explore its eastern coast, but in Low's map it is represented as consisting of lime stone. To the southeast of Hazen island I saw five islands which are evidently the Calthorpe islands. I took the relative bearings of these islands and also took note of their size and general conformation. I also obtained a good sketch map of them and of the large sound lying to the east from a native in Igloolik who was in the habit of hunting walrus, seal and salmon in that locality. These islands run from 100 to 200 feet in height. Along the south coast of Hazen islands and in the vicinity of the Calthorpe islands Parry got surroundings of 13, 15, 18, 20 and 21 fathoms.

South Channel.—South Channel is the southern entrance to Murray Maxwell bay and is about five miles long and two miles wide with a depth, according to Parry, of between 28 to 35 fathoms. At the northern end of the channel, right in the centre is a small island, about a mile long, half a mile wide and 50 feet high, which I named Deer island. This island, which consists of granite, diabase and a blackish-brown-rock with a good grass beach, is a favourite resort of the Igloolik natives in summer, as the channel abounds in seal and walrus and about twelve miles away to the east, on Hazen island, a fine salmon river empties from a small lake by a short river into a small bay. The natives also spear the caribou that swin across the narrow channel from Hazen island to the long promontory on the west side of South Channel in the summer, using their harpoons and kayaks for the purpose.

South channel is not safe for ships entering Murray Maxwell bay as the channel is constantly blocked with ice and very swift currents flow through the narrow passage.

East Channel.—On the north shore of Hazen island is a long channel, running east and west, just south of the 70th parallel.

This channel, which I have named East Channel, is the only safe approach for vessels entering Murray Maxwell bay. East Channel is about 19 miles long and four miles wide. In the centre of East Channel, near the eastern entrance are two small islands, each about three miles long and one and a half mile wide and separated from each other about four and a half miles.

Reader Sound.—East of Murray Maxwell bay, from which it is separated by a long curving peninsula about ten miles wide and 35 miles long, is a long sound that penetrates deep into Baffin Land in a north-westerly direction. This sound which I named after Mr. Reader, who has assisted me with the map and who is mainly responsible for the compilation of this volume, is about 60 miles long and varies from four to ten miles in breadth. Reader sound, so the natives informed me, loses its ice early in the summer and the two bays at the head of the sound would afford good sheltered anchorage for ships. Into the most westerly of these bays, a large river, about twenty miles long, empties from a large lake which lies to the north-west and which the natives called Tass-uwa. Tass-uwa lake abounds with thousands of the finest Arctic salmon.

The promontary between Reader Sound and Murray Maxwell bay is composed of a number of rounded hills that rise some 500 to 700 feet above sea-level, with many valleys in between. These hills are composed of granite, diabase and rusty rocks, which are covered with an abundant growth of Arctic herbage on which graze numerous herds of Arctic caribou.

Patricia Lake.—Some seven miles east of Reader Sound and about five miles north of the 70th parallel is a long circular lake which I named Patricia Lake, in honor of H. R. H. the Princess Patricia. This lake empties to the south-east by a long river into a large bay on the northern shore of Fox Channel. The natives of Igloolik told me that they frequently visited Patricia Lake, which abounds in fine salmon, and also for the purpose of hunting the large herds of caribou that are found in its vicinity. They also told me that foxes are very numerous there and that Polar bear were often killed along the shore.

Murray Maxwell Bay.—Murray Maxwell bay is a large oval bay or indentation in the Baffin land coast that lies along the seventieth parallel of latitude and between 77° and 80° longitude. It is about 65 miles long from east to west and 25 miles wide from north to south, being somewhat narrower at the western end. It is surrounded by smooth stretches of narrow gravel beach from which rise a number of rounded hills, 50 to 800 feet in height, and which are covered with a profusion of Arctic herbage on which large bands of caribou are found pasturing at all seasons of the year. These hills consist generally of the usual granite and diabase and blackish-brown rocks that characterize the region.

In the centre of the north shore is a low point which puts out S. E. for about four miles into the bay and which from 1½ to 2 miles wide. This point I named Fox Point.

Four islands.—East of Fox Point is a good salmon river and four small islands rise from 100 to 400 feet in height and are composed of the same rock as the mainland. I named them the Four Islands. Each island is about two miles long and one mile and a half wide; and they are separated by channels two to three miles in width. The most easterly island is somewhat larger than the rest. A small river, about five miles long, discharges from a small lake into the bay opposite the centre of the Four islands, and is said by the natives to contain salmon. A third river, also said to contain salmon runs from a lake into the western end of the bay.

Murray Maxwell Bay ful of ice.—Murray Maxwell bay is generally jammed with ice the whole year round as the pans are driven back at the eastern entrance by the northern current which sweeps up the west coast of Baffin land and the south channel is generally completely blocked by the westerly current that sweeps in through Fury & Hecla strait.

Cross Murray Maxwell Bay.—April 22nd.—A fine, bright, clear, cold day with hardly any wind stirring. We started at daybreak from Seal Point and travelled all day over very bad ice which formed the surface of Murray Maxwell bay. Before leaving I left a board on the point with my name cut on it, and a record in an empty cartridge at its foot.

After starting, we visited the waterhole in a last endeavour to kill a seal. Nookudla shot at one and missed it; the only one we saw.

We stopped at Deer island to pick up an old seal that Avoie had cached there, when I took the opportunity of ascending the island and obtained a splendid view of Murray Maxwell bay and the surrounding country.

We travelled all day across the centre of the bay, generally north by west, towards Fox Point. About noon we crossed a large crack that bisected the old Arctic ice-pans right across the bay, from north to south. This crack was filled with snow and crumpled ice, and we had hard work to pull the heavy laden sleds across it. We steered for Fox Point as one of the Igloolik natives Ee-to-lee-go by name, had cached a very fine pair of walrus tusks and a fine foxskin near the point, and I was anxious to get them. These walrus tusks weighed fully eight or nine pounds a piece and were of the finest ivory. Avoie had also cached there two large oogjook (big seal) skins, which I bought from him. I also wished to pick up the foxtraps that Ootootia had laid round the point. With the aid of a telescope I gained a magnificent view in the clear atmosphere, of the entire coastline, east, west and south. To the east I made out the entire outline of both shores of the East channel and could see the smoke rising from the open waters of Fox channel that lay beyond.

After leaving Fox Point we travelled in an easterly direction until we reached the second of the Four islands and pitched camp on a small point on the north shore near the small river that enters the bay at that point. We found some good snow for the igloos and passed a fairly confortable night, although I suffered terribly from thirst all night, which was a common occurrence during my travels in the far north.

Begin the overland journey.—April 23rd.—The day broke fine and clear, with but little wind. We started about 10 a.m. and striking north, along the banks of the small river, began our long wearisome and hazardous journey across Cockburn land. I saw plenty of caribou grazing on the small hills to our right, and five miles from the bay crossed a small lake, about three miles long and one mile wide, from which the river took its source, and which the Eskimos told me was full of salmon.

A Hunter's Paradise.—The country all round the Murray Maxwell bay consists of rolling rounded hilles of red granite, boulders and gravel, from 50 to 200 feet high and covered with a luxuriant growth of Arctic vegetation. This is a favourite feeding ground for vast herds of caribou, and wolves, wolverene and foxes roam over the country. The rivers and lakes teem with Arctic salmon, and geese, ducks and birds innumerable make it their nesting ground in the summer. The waters of the bay contain large numbers of walrus, oogjook (big seal) and Harbour seal, which latter are highly prized by the natives for their rich and handsome fur.

In the summer time, during the months of June, July and August it must be a veritable hunters' paradise.

South Caribou Mountains.—When we had proceeded about twelve miles from the bay we passed on our left a curious, flat-topped, steepsided range of hills, about 500 to 600 feet in height, which ran S E and N W for a distance of about 40 miles. This range was covered with grass and Arctic herbage and is a favourite grazing ground for immense herds of caribou. Here the Eskimos in the summertime kill the caribou which are then fat and easy to approach, with the bow and arrow. Avoie told me that once he had seen through the telescope, the entire range so densely covered with feeding caribou that he could scarcely see the land I named this range the South Caribou Mountains.

North Caribou Mountains.—Running parallel to this range, and about ten miles further north is another, similar range, although slightly lower in altitude, which I named the North Caribou Mountains.

These flat-topped hills are composed of Archaean rock and black, rusty gneiss, with steep hill-sides which are covered with thick soil on which grows an abundant vegetation.

Tassuwa Lake —Between these two ranges, lies the fine lake Tassuwa, which is about 25 miles long and from 4 to 6 miles in width, and which communicates by a large river, about 20 miles long, with the head of Reader Sound to the south east. Tassuwa lake according to the Eskimos swarms with Arctic salmon of medium size.

After we had travelled about 15 miles in a direct line from the bay, although we had covered much more ground owing to the sinuosities of the trail, we reached Tassuwa lake. The ground over which we travelled was very hilly and the snow was from 20 inches thick and the heavy sleds would continually break through the crust. Both men and dogs were completely worn out by the heavy going when we reached the lake, and we pitched camp on the middle of its frozen surface, about four miles from the river outlet at its southern end.

Caribou hunting.—April 24th.—The day broke very cold and clear, with a light north wind blowing. Travelling over the smooth ice and snow-covered surface of Lake Tassuwa we made an easy day's march and reached the western end of the lake at about 8 p. m. in broad daylight; as the sun does not set at this time of year in that latitude before 9.30 p. m. We pitched camp at the foot of a small hill, about three miles from the west end of the lake. Seeing numerous deer tracks around the head of the lake, Nookudla and I started after them with a sled and our rifles, being followed by Makatawee's boy on a small sled. After walking through the snow for about five miles from the lake towards the west end of the North Caribou range, I succeeded in killing three caribou at 400 to 500 yards range. Nookudla wounded one which the dogs caught the next day. We brought the three I had killed back to camp on the sled arriving there about eleven o'clock at night.

April, 25th.—A beautiful bright sunny day. We remained all day at the camp at the west end of Tassuwa lake in order to let Avoie bring some caribou fat and meat which he had cached the previous summer on the south shore of the lake. When he returned the meat proved to be rotten but we ate it nevertheless and gave the dogs some. It was either eat that or starve; and we chose the former alternative. In the morning Nookudla and I went after some deer and also to recover two of his dogs which had run away after the deer he had wounded the evening before. We tramped all day through heavy, rotten snow and eventually found the dogs lying down beside the remains of the deer, which they had overtaken and killed. They had gorged themselves so that they could not stand up, and we were obliged to cart them back to the camp on the sled. We saw plenty of caribou but the dogs made so much noise with their barking that we could not get within range.

Quartz Lake —April 26th.—We started shortly after sunrise, about 4 a. m. and travelled all day in a northerly direction till we reached a large lake at about ten o'clock that night. This lake which I named Quartz lake, lies north and south along Long. 82° W and Latitude 70° 50′ N. It is some 12 miles long and two to four miles in witdh. A large river flows out of the southern end of Quartz lake in a south-easterly direction and probably forms part of the river that flows into Murray Maxwell bay just to the east of Fox point. Another river flows into the northern end of the lake and probably is the same stream that flows out of the southern end of Fox lake, 40 miles to the north. In this case this river, which I named the Fox river, has a length of over a hundred miles and drains half a dozen goodsized lakes and a large area of country. In the vicinity I found an abundance of quartz and rock crystal. The country traversed, between lake Tassuwa and Quartz lake, consists of a low, rolling hills of granite and gneiss rock and gravel, covered with grass. These hills vary in height from fifty to 200 feet and are intersected by numerous, winding ravines and gullies. I saw several small herds of caribou during the day and the snow was covered with their tracks, but they were very wild and would make off at a great rate behind the hills when they heard us approaching. From one herd of seven caribou I killed three at a range of 600 yards. My right eye, which I had frozen when hunting seal was still very painfull and blurred, so that I had difficulty in taking a clear sight at the deer.

The day was a most disagreable one, as it snowed heavily all day and a strong, bitterly cold north-west wind that blew right in our teeth. I froze my nose when after the caribou and, losing my left mitt, froze the fingers of my left hand; neither of which was conducive to good shooting. But for the long range and flat trajectory of my 280 Ross I am convinced that we should all have perished, as the deer were so wild and the dogs when pulling the sleds, made so much noise that the only chance was to hit them on the run at long range-seldom less than 500 to 900 yards. The Eskimos with their old, high trajectory Martin-Henrys and Mausers could not hit them at all.

We covered fully 25 miles that day, in a direct line, and travelled actually half as much again before we pitched camp, after the sun had set, on the east side of Quartz lake. It was very heavy travelling as we had to be constantly helping the dogs to pull the heavy sleds against the strong head wind through the rotten snow and over innumerable small hills and ravines. About 8 miles before reaching Quartz lake we came to a small round hill, covered with grass, where Avoie told me he was in the habit of camping every summer, when after deer. From the side of this hill I obtained some quartz samples, after I had scraped the snow away with a shovel.

April, 27th.—We spent all the next day camped on the frozen shore of Quartz lake, in order to rest the dogs and for the purpose of replenishing our empty larder. I also examined, as far as the snow-covered ground would allow, the rock formation round Quartz lake. We killed no caribou as they had all disappeared, having evidently been alarmed by the noise of our progress through the heavy snow, and sound travels wonderfully far in the still, frozen atmosphere of the north. On a calm day I have often heard the yelping of dogs for more than an hour before they came to sight.

When hunting around the shores of Quartz lake I came across the bones of many caribou that had been slained and devoured by the wolves.

The Arctic Wolf.—The Arctic wolf is somewhat larger and more leggy than his southern compatriot and attains a length of 5½ feet from the nose to the tip of the tail. The tail is large and bushy and is about 18 inches long, and, unlike the dogs, is carried low. An adult male will stand 34 inches at the shoulder. The females are somewhat smaller with finer muzzles and less bushy tails.

The hair is long and coarse, especially on the neck, flanks and thighs; it is thick and bristling round the neck. The colour in summer is a dirty yellowish white, mixed with black and gray; in winter the coat turns to a whitish gray. The skin is worth about $10.00.

They travel in packs of from four to eight, although frequently the track of a large sigle wolf will be seen in the snow. They can outrun the fastest horse, and their daily range in search of food will average thirty or forty miles. They live mostly on the caribou, of which they kill and devour large numbers, especially the does and fawns. But they will eat anything when hungry, dead meat, leather, moss and grass. The Arctic wolf is cowardly and very wary, which make it very difficult to trap or to kill. It has very powerful jaws and its bite is terrible. They are subject to rabies when they are more to be feared than the most savage dogs. They devour their own dead and sick companions and the females have to hide their offspring for fear of their suffering the same fate. The female gives birth to four or six young ones in the spring, which remain blind for about 8 or 10 days. She gives them milk for six weeks and then nourishes them on meat, which she has previously chewed. In one year the young ones are able to hunt for themselves, and are full-grown at two years of age. Their sense of smell is very keen and they would scent out live or dead game several miles away.

In the north they are cowardly and rarely attack a man, unless desperate from extreme hunger and in a band. They are very crafty and are rarely caught in a trap. Their howl in the lonely stillness of the Arctic night is a blood-curdling sound and causes a cold chill to descend the spine when heard for the first time.

April, 28th.—A fine, clear, intensely cold day with a light wind from the north. From Quartz lake we journeyed due north following the 82° west parallel of longitude. We journeyed over rough hills and boulders, covered with snow, through, which we would plunge, often waist deep. The dogs had not eaten for two days and were, in consequence, weak, and suffered considerably. The caribou we had killed we were obliged to keep for our own food. We shot nothing that day and after travelling some 12 or 15 miles, camped in a ravine amongst the low hills. That night my sleeping bag was frozen and I had some difficulty in getting into it.

Cross Fox River.—About six miles north of Quartz lake we crossed the bed of a river which flowed into Quartz lake and which we did not cross again. I presume it is the same stream that runs out of Fox lake further north and I named it the Fox river.

April, 29th.—Clear, cold and bright. We continued our journey north under the same heartbreaking conditions. During the day, Nookudla, shot a deer and I killed two: the second one I wounded and, having no cartridges to spare, stalked and despatched it with my hunting knife, after a desperate struggle with the wounded animal. This gave us enough meat to give a medium sized meal to the 14 persons and the 41 dogs comprising the party, Avoie having turned back at Quartz lake, to return to Igloolik. It generally took four large caribou to give us all a good meal as the deer were light and in very poor condition.

Wolf Lake.—April, 30th.—Clear, bright and cold with little wind. We continued our journey north until 3 o'clock in the afternoon, when we halted as I saw some caribous in the distance. We halted on the east side of a small lake and went after them. After a hard chase, lasting several hours, I succeeded in killing four at 500 to 900 yards. Peewikto and Nookudla were with me but did not manage to kill a single deer. Coggan also shot one. Nookudla left his load at the small lake, which I named Wolf lake, on account of the many wolf tracks in the neighbourhood, and travelled with his dog-team and sled to a cache that he had left near five small lakes that lay about four or five miles east of our trail. I named these the Five Lakes.

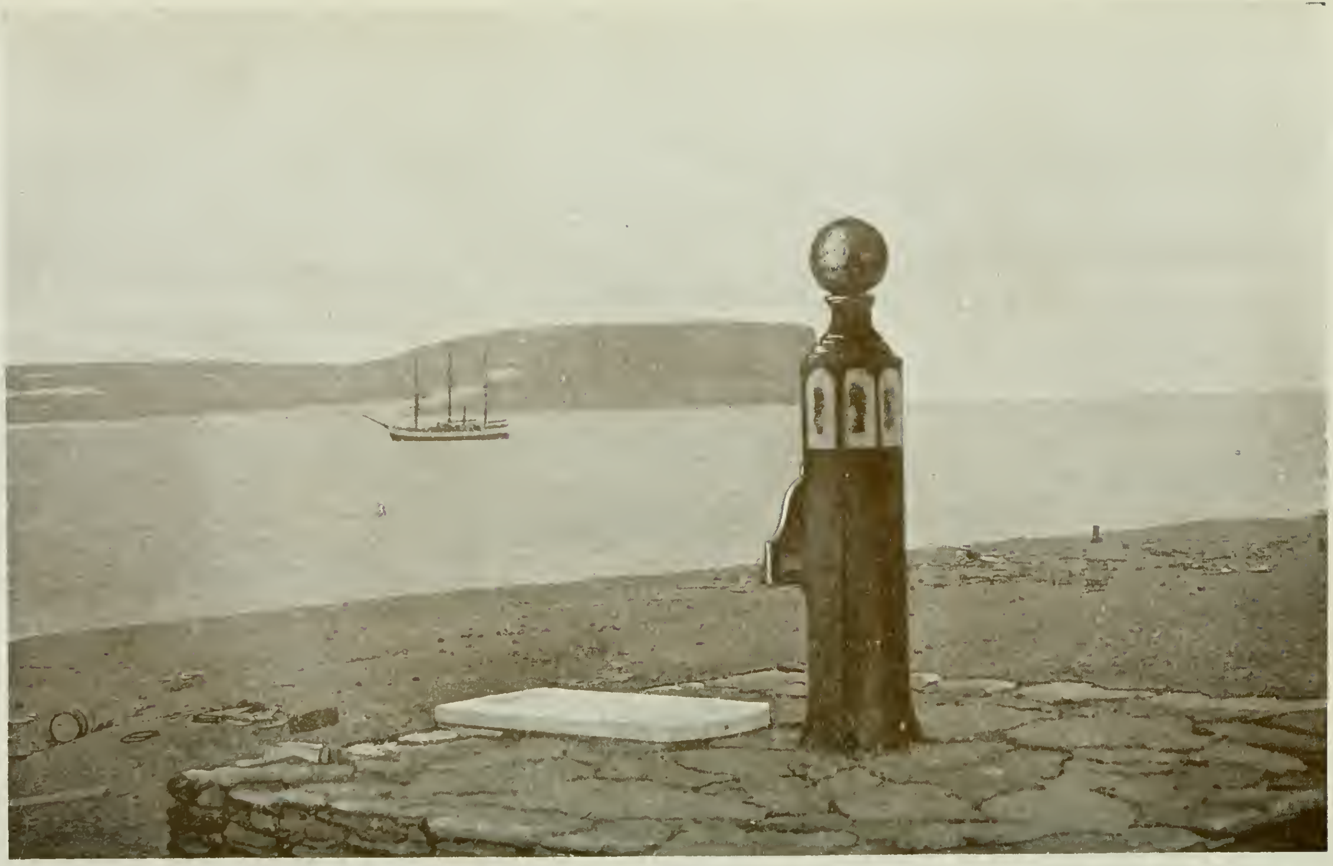
Before reaching the southern end of Wolf lake, I set out in the hope of killing some more caribou, as I saw a herd of at least, 200 three-quarters of a mile away. Peewikto, Nookudla and I started after them, but when the dogs that were drawing our sleds caught sight of them they began to bark and made such a noise that the deer made off at top speed. I wounded one at long range, but it escaped. We returned to camp late that night, dispirited and thoroughly worn out with our fruitless chase all day after the vanishing deer and the rough snow-covered country.

Twin Lakes.—May, 2nd.—Clear, cold and bright sunshine. Starting early from Wolf lake, we proceeded north for about five miles, when we reached two small lakes that lay close together, and which I named Twin lakes. About a mile north of Wolf lake we came on a very bad hill, about 3 miles long, where we had to throw off half the loads in order to climb it, and then return for the rest of the loads. The road was very rough, rocky and covered with deep snow. On each side of the road between Wolf and Twin lakes are two high hills, about 700 feet high and four miles apart. These hills were covered with snow except where large masses of boulders and gravel occasionally showed through. To east and to west of us, about 25 to 30 miles distant, lay two long, high chains of mountains, which ran generally north and south. These mountains I judged to be from 1200 to 1400 feet high and their massive rounded peaks, covered with snow, showed up well against the clear sky.

Caribou trails.—We pushed on to the Twin lakes and camped about three or four miles to the north of them. Wolf and caribou tracks crossed the snow in every direction, as this point lies in the route of their annual migration from Cockburn land to Brodeur peninsula. They migrate towards Scheming and Brodeur peninsula in the spring and return south to the shores of Fox channel in the Fall.

Out of food.—We shot nothing during the day and both dogs and men were gaunt and starved-looking and showed plainly the effects of the continous hard work and want of food. Continous hunger, thirst, sleeplessness and fatigue added to the miseries of the trip and our minds were kept in a state of constant anxiety as to whether we should be able to kill enough deer to enable us to reach Milne inlet, and whether our cartridges would hold. I passed a bad sleepless night on account my sleeping bag being frozen. Our meat was all finished and we had just enough oil left to light two small lamps, which we gave to Coggan's wife as she had a small baby with her. The dogs had not eaten for three days, and we still had five days of rough, heartbreaking travel ahead of us before we could reach Milne inlet, where we might hope to kill a seal, and after that another 130 miles before we could reach Ponds' inlet and safety.

An Eskimo tragedy.—It was at this spot, eight years before, that a party of Eskimos, consisting of three men, their wives and four children, who were making the overland journey from Ponds, inlet to Igloolik found themselves in the same predicament as



Sir John Franklin Memorial Tablet.

ourselves. The deer were scarce and too wild to be killed and their dogs gradually died of starvation. They lived on the dogs while they lasted, and then, one by one, the menbers of the party succombed. Three children died first, a girl of five, a girl of seven and then a girl of thirteen years of age. As they died their bodies were eaten. Then two of the men and two of the women died, and the survivors lived on their corpses until another Eskimo happened to come along and rescued them, taking them to Igloolik. Of the three survivors, the man and a boy soon died after reaching Igloolik from the effects of their suffering and privation. The sole survivors now living is a woman named Attow-oo-tar-oo now the wife of Ee-to-tard-jooa, the headman of Igloolik and who I saw in Igloolik. She is a sister of Coonoo's, Wilson's guide.

Our present plight reminded us of this tragedy and we felt none too bright over the prospect of reaching Milne inlet alive The scarcity of cartridges was what bothered me most and I often gritted my teeth as we shot nothing on that day.

May 3rd.—The day was fine and clear, with a bright sun shining overhead and we started early. When loading the sleds I saw three caribou on a nearby hill and going after them, shot and killed one at about a 450 yard range using up one of our precious cartridges. The entrails were fed to the starving dogs that fought desperately over them and nearly strangled themselves in their struggle to get a mouthful.

Fox Lake.—After this welcome, if scanty repast, we travelled north for about five miles until we came to a lake, which I named Fox lake, on account of the number of fox tracks which marked the snow in all directions. Fox lake is about 5 miles long, two or three miles wide, and lies generally north and south. The lake was covered with a thick crust of snow through which the tired dogs and the sleds kept continually breaking; which made our progress both slow and painful. I pulled so hard in the traces that I strained both shoulders and could hardly sleep for the pain at night. Peewikto and his little wife, Tootillik, showed great pluck and endurance and pulled away at the sled, day after day. On reaching camp we had barely enough energy left to build an igloo. We camped at the north-west end of Fox lake.

Round Lake.—May 4th.—Another fine, clear day with a light north wind. We started early in the morning from Fox lake and after travelling for a few hours, reached a small lake, which I named Round lake. On each side of Round lake, east and west, there is a high mountain, about 1000 feet high and about 6 or 7 miles apart. The face of the one to the east is square.

The road was a difficult one for the heavy sleds and consisted of a number of small hills which had to be climbed and which were covered with rotten snow. The dogs and the sleds kept breaking through the thin crust and the exertion of continually pulling them out was very trying to us, in our weakened state. We pushed on another five or six miles to the north end of Round lake, where we camped. I killed a caribou not far from the camp at about 600 yard range, which left me with only four cartridges to provide us with food until we reached Ponds inlet, 150 miles away.

Height of Land.—A river runs out of the north end of Round lake and runs due north until it falls into the Peewikto river, near its mouth. The height of land is apparently between Round and Fox lakes as the river which runs from the former lake flows north while the river that flows out from the Fox lake flows south.

Eskimos meet us.—That night a number of Eskimos from Ponds inlet camped near us as they were on their way to hunt caribou betwenn Fox and Quartz lakes. Their names were Tom Lasso, Panniloo, Noota-rah-riac, Kilooti, Jocano, Makaskaw and Pannikpa the Angekok. They were all accompanied by their wives.

They had brought very few provisions, as they were depending on killing enough caribou to feed themselves and their dogs; and their cartridges were of no use to us, as their rifles were all of a different pattern. They told me afterwards, on their return, that they had had a very hard time on account of the deep snow, thick fog, high wind and the fact that the deer were so wild. They did not kill many deer in consequence, and, running out of tobacco, hurried back to Ponds inlet for a fresh supply. Tom Lasso told me, "Me no more hunt deer in snow".

Peewikto River.—May 5th.—Light snow fell and a cold northwest wind blew about ten miles an hour. Leaving Coggan behind to rest his dogs and hunt deer with the rest of the natives from Ponds inlet, we made an early start. We travelled east by north along a valley full of small hills, flanked on each side by high mountains that rose from 1000 to 1200 feet above us. After travelling about twelve miles we reached a river which I named after my faithful Peewikto. Peewikto also means in the Eskimo language "bad" and was applied to Peewikto when he was a little boy; his right name was Kow-bak-too, which means "Chief". The Peewikto river is a "bad" river and is consequently well named. We reached this river at a point about 20 miles above its mouth.

The Peewikto river flows in a north-easterly direction, in a very crooked, sinuous fashion, into head of Milne inlet. The riverbed is from 50 to 100 yards wide and flows, by a series of continuous chutes, cascades, rapids and falls, between mountains that rise 500 and 600 feet on each side. As Milne inlet is approached these mountains become higher. The riverbed itself was a mass of boulders, rapids and falls; some of the latter being 50 to 100 feet in height, and when we came to these we were obliged to leave the riverbed and follow the sides of the hills. Sometimes we would have to ascend 300 feet above the riverbed to avoid these dangerous falls. We could then throw off half the loads and make two trips. All this entailed the hardest kind of work for men and dogs and, owing to our weakened condition, caused us to make slow and painful progress.

Hayes, Expedition.—On February 14th. 1907, Mr George Hayes, chief officer of the C. G. S. "Arctic" started from Albert Harbour with a well equipped party to make the overland journey by way of Milne inlet to Igloolik with instructions to ascertain how far south Milne inlet ran and to learn from the natives the ice-conditions of Fury & Hecla strait with a view to studying the possibilities of navigating that strait. Hayes returned to the ship on March 5th having been away 19 days and was forced to return on account of losing some of his dogs.

He appears to have reached somewhere in the vicinity of Round lake and he reported Milne inlet as extending as far south as latitude 71° 30'N. This must be an error as the position of the entrance to Milne inlet is well established and the inlet is not more than fifty miles long, which would place its southern end about latitude 71° 50'N.

The riverbed was full of sharp, jagged and polished boulders, of a hard yellowish-brown limestone, and betwenn these were deep holes filled with ice and snow.

About twelve miles from its mouth, the river branches into two streams, forming an island in the centre, which is about a mile long, half a mile wide and 300 feet high. At this point Nookudla stopped, saying that his dogs were tired and could go no further,

Reach Milne inlet.—I, with Peewikto, Tootillik, old Oototia. his wife and boy continued to work our way slowly down the riverbed, all day, all that night and all the next day and night (May 6th) without stopping to eat or rest. At midnight on May 6th, we reached the head of Milne inlet, when we hastily built an igloo and tumbled into our sleeping bags, without having anything to eat, and fell asleep from sheer fatigue. Since leaving Round lake we had travelled three days over the roughest country possible for sleds to pass over, with practically no food, save for the nourishment we could extract from sucking the grease and blubber of some sealskins that we had brought with us from Murray Maxwell bay.

May 7th.—We slept till about 2 p. m. and then remenbering that the dogs had eaten nothing for four days, Peewikto and I took two dogs and went in search of a seal on the ice of Milne inlet.

I had but four cartridges for my rifle and each of us had a harpoon. We took the dogs to help us to find the seal holes by their keen scent. We travelled in ziz-zag fashion across the bay until

8 o'clock that night, when the dogs found the remains of a young seal which had been killed and partially eaten by a fox. When we rescued the remains from the dogs, there was about three pounds of meat left, which we took back to camp and after dividing it into six portions devoured it raw in its frozen state. The rest of that night we spent in resting ourselves and our dogs, as we still had 130 miles to cover before reaching Ponds inlet.

May 8th.—We travelled due north all this day and all night, along the eastern shore of Milne inlet. The day was bright, cold and clear with little or no wind. The ice was good on the sound but the poor dogs that had eaten nothing for nearly six days, kept falling down from sheer weakness. We had to kept whipping and shouting at the poor brutes to make them get up and travel at all.

Meet some Eskimos.—I took good note of the coast as we passed long it and we camped along side the east shore of Milne inlet opposite the large island of Kai-giook-ta-soog-joo, about 2 a. m. on the morning of May 9th. We stopped here as I heard some dogs barking near the shore and found two Eskimos camped there, with their wives and two small children. They proved to be Filla-Kap-si and Takkowah on their way back to Igloolik and Aggo by the same trail that we had just crossed. They gave us a little seal meat that we ate raw, before going to sleep. We ate only a little for fear of becoming ill after our long fast. We let the tired dogs sleep a little before giving them anything to eat, as in their exhausted condition, to have allowed them to eat anything straight off the march, would have killed them. In the morning we brought each dog into the igloo and gave it a small portion of meat; about two hours later we repeated the operation, as their digestive apparatus needed careful nursing.

Had we not met those Eskmos we should undoubtedly have been obliged to kill several of the dogs to feed the others and ourselves, as we could see no seal and had only four cartridges left.

About twelve miles south of where we were camped, and just opposite the entrance to Kolukto bay, there is a bay on the east side of Milne inlet, with a small island in the centre, which the natives call Toogar. A small salmon river runs from a lake into the north-east corner of the bay.

Another Eskimo tragedy.—At Toogar, about 40 years ago, a party of thirteen Eskimos, who were travelling from Igloolik to Ponds inlet, went through a similar experience to ourselves and having nothing more to eat, could proceed no further. Eleven of the party died and the survivors lived on the dead bodies of their companions. Only two men of the party survived and managed to reach Ponds inlet alive.

East coast Milne inlet.—After resting a few hours we started again about 7 a. m. in the morning and continued along the northeast shore of Milne inlet. After going due north about six miles, the coastline took an abrupt turn to the east by north and ran in that direction for about 14 miles, when it turned abruptly again to north by east for another eleven miles, when it debouches into Eclipse sound. In this angle of the coast are two large islands and three smaller ones. The natives call the largest island Immiggin and the second largest, Kai-joo-ark-too. The channel between the southern extremity of Immiggin and the mainland is only about 300 yards wide, which the Eskimos from Koluktoo use as a short cut to Ponds inlet. In the summer from August 20th to September 20th this channel could be used as a schooner passage. We stopped that night, the sun only set for a couple of hours at this time, for two hours to rest the dogs about four miles from Eclipse sound, in the channel that lay between Kai-joo-ark-too island and the mainland. Here we found an old igloo that had been built by Tom Lasso, and finding inside some old sealskins gave them to the dogs to gnaw.

The last lap.—May 10th.—At daybreak we started again on our last lap for Ponds inlet as I was anxious to see white faces again after so many months of hardship and wandering in the frozen north with only Eskimos for my companions. I was also consumed with an intense longing for some wholesome and palatable food, a warm dry bed and some clean clothes.

The day was beautifully bright and a warm sun shone overhead, as if to make me forget the long days of merciless cold and Arctic gloom which I had passed through. The ice on Eclipse sound was very good in places, in others it was covered with deep, heavy snow, which made fast travel difficult.

Enter Eclipse Sound.—On rounding the point Eclipse sound opened up before me in all its glory and dazzling splendour. On my left were the snow-white, serrated peaks of Bylot island with the glittering, ice-covered sound at the foot. In front, to the east, rose the majestic, blue-black triangular mountain of Ee-yuk-tsua, at the foot of which, only seventy miles away, lay the village of Ponds inlet; where I could revel in good food, warmth, cleanliness and rest my weary and aching limbs. My heart rose at the sight and urging the dogs to full speed we made in the direction of Salmon river. The dogs refreshed with food and rest travelled well and made about five miles an hour.

At noon we sighted the wooden shack at Salmon river, and at the sight I was overtaken by an almost unbearable sensation of intense thrist and desire to eat. We reached the shack at about 2 p. m. and, pounding on the door, I was admitted and warmly welcomed by Messrs Reader, Wilson and Lawson, who had heard from a native that I was coming.

On seeing friendly, white faces once more I was almost overcome and completely lost the ravanous desire for meat and drink which had possessed me. I had almost lost the power of expressing myself in French and English having been so long with the Eskimos that I could only express myself in a braken misture of the three languages. After a good meal of soup and sourdough bread we all felt better. Peewikto and Ootootia revelled in a good smoke, as they had both run out of tobacco long since.

We rested up for several hours, exchanging our news, and then resumed our march to Ponds inlet, about 12½ miles further east where we arrived about one o'clock that night. The rest of the party, had seen me coming over the sound and were all up to greet me. They all extended to me a warm welcome and it was very early in the morning when we went to bed; having so much to recount and talk over.

I remained at Ponds inlet from May 11th to June 15th, during which time I helped to repaint the schooner and prepared her for sea; mined and freighted coal by sled from Salmon river to Ponds inlet, and also spent a few days with my friends at Salmon river.

I was very thin when I returned from my hard journeys and. my head often ached badly from the strain and hardships I had undergone. Abcesses formed at the foot of the teeth in my lower jaw and I suffered agonies from toothache.

CHAPTER XI

TREMBLAY'S—EXPLORATION OF ECLIPSE SOUND, NAVY BOARD AND MILNE INLETS.

Leave Pond's Inlet.—I started from Ponds inlet on June 15th (1913) to make a flying trip round Navy Board inlet and Eclipse Sound, with the special object of exploring the large sound at the west and of Eclipse Sound near the entrance to Milne inlet, as it had never been visited before by others than the Eskimos.

It was late in the season as the ice on the sound was melting fast and was covered with pools of water. The snow had melted and left the surface of the ice like the face of a rasp which played havoc with the dog's feet. At this time of the year the Eskimos place small sealskin boots on their dogs' feet to protect them from the sharp, knife-like projections of ice that cover the sounds; but we did not have enough of these feet-protectors and those that we did have kept constantly working off, and the dogs suffered intensely from the cut and bleeding feet and were all lame at the end of the trip.

The day was a perfect one; a bright, warm sun circled in the heavens above us, day and night, and a light westerley breeze gave the air an exhilarating tang that filled one with a delightful sense of health and energy.

Peewikto and Tootillik accompanied me and we took a sled, nine fresh dogs, a sealskin tent, seal stove and enough provisions and blubber for the stove to last us twelve days, which was the time I estimated it would take us to complete the tour. It actually took us *27 days* and turned out to be a much more arduous and hazardous undertaking that I had anticipated. We also took the body of a seal along to feed the dogs and to supplement our supply of fuel.

Bylot island.—We called in at Salmon river where I spent an agreeable hour with my three friends stationed there and then started off across Eclipse sound in a north-westerly direction towards Bylot island. Many seal were basking on the ice in the warm sunshine, and we camped that night on the south shore of Bylot island. As the snow was all gone, we pitched our sealskin tent on the shore at about one o'clock in the morning with a bright sun shining overhead. The dogs suffered greatly from the rough sharp ice that cut their feet when crossing the sound.

During the day, when in the middle of the sound, the dogs suddenly scented a seal hole and bolting in that direction, nearly wrecked the sled amongst some ice boulders; and one of the dogs was nearly killed by being caught under the sled.

A gale.—June 16th.—We had just finished pitching the tent at one a. m. on a low, flat, gravely point in front of an inland glacier when the wind changed to north-west and was accompanied by a whirling tempest of damp snow. That night I heard some geese "quacking" as they flew overhead.

We remained here all day in order to repair the broken sled and harness. A north-west gale accompanied by a heavy snow and rain, raged all day, blowing the tent down several times and wetting our clothes and bedding. Travel was impossible in such weather, as the rain and damp snow falling on the ice froze instantly into rough particles like coarse sandpaper that would have cut the dogs' feet into ribbons.

June 17th.—Making an early start we travelled west along the south shore of Bylot island, which consists of hills of sandstone and gravel that gradually slope out to the low, rounded and almost imperceptible point at the south-west corner of the island. We saw many seal basking on the ice, of which I shot one and Peewikto shot an Arctic goose. The day was cold, raw and black, with a strong south-east wind blowing accompanied by a heavy rain-squall We travelled all day over soft, slushy snow, mixed with water that was about twenty inches deep, into which the sled kept sinking; and our progress was slow and laboured. The sled would keep gathering a heavy mass of slushy snow at its prow, which kept us constantly busy freeing it and tugging at the traces. Our feet and legs were damp and half frozen through trudging all day and night in the wet slush.

Toolooria —We crossed Navy Board inlet and camped at 4 a. m. the next morning near the village of Toolooria, which is situated about seven miles south of Low point.

Navy Board Inlet.—June 18th.—We started again at 11 a. m. and marched north all day along the west shore of Navy Board and past the village of Kilutea's. We travelled all that night and all the next day and camped the next night (June 19th) on the west shore of Navy Board, about seven miles south of Lancaster strait.

Local winds.—After rounding Low point we trudged for many miles through deep slushy snow and water, which made the journey very slow and laborious, and the dogs' feet were all swollen and bleeding and they were completely worn out when we rea-

1—Bylott Island at Midnight.
2—Baffin Land, Midnight View.

ched our camping ground. The day was dull and leaden, and a cold north-wind blew in our faces piercing us to the marrow. The wind blew from the east during that day at Salmon river, as the winds there are entirely local as a result of the conformation of the land and the protection afforded by Bylot island. The north winds that sweep down Navy Board are deflected by the high range that runs east and west some eight miles south of Salmon river and are there converted into westerly and north-easterly breezes.

Lancaster Sound.—June 20th.—Leaving the tired dogs in charge of Tootillik, Peewikto and I walked up Navy Board as far as Lancaster Sound; and then north-west for about eight miles, along the shore of that strait, opposite Adam's island. We returned overland across the low, flat hills that form the north-east corner of Borden Peninsula. The day was foggy, with light rain and snow, and a light north wind blew in our faces.

State of the ice.—The ice in Navy Board ended between Adam's island and the Bylot shore, and Lancaster sound was a body of open water, filled with broken ice-pans that were being carried east-ward by the current into Baffin bay. I counted fifteen large icebergs that were jammed between Adams island and the mainland.

Leave record.—The ice on Navy Board was covered with water and many seal could be seen basking on the surface, I left a record of my visit in a cartridge placed at the foot of a board on the point. We reached camp about 11 p. m.

Objects of trip.—My object in re-visiting Navy Board inlet and Lancaster strait, was to study the condition of the ice at this time of the year, to verify the topographical features of the coastline and to look for mineral.

Anchorages and Navigation.—According to Captain W. F. Milne who commanded fot many years the Scotch whaling steamship "Eclipse" and who was the first navigator to explore these sounds; "There is a fine anchorage and shelter from southerly gales inside the Wollaston islands; and six or seven miles farther south, on the west shore of Bylot island, a bay called Tay bay, where a ship can anchor in any depth of water she pleases. Going from here south a vessel should keep in the middle of Navy Board inlet—the points in the old charts are too prominent—but should keep well away from the low land on Bylot island; no less than three miles, as it is shallow and extremely dangerous when the weather is thick. From here towards Milne inlet, steer between high island, pass close to same, steer for two low islands (Bizzi-Tark-pin) and keep them on the port hand. Keep to the west all the way until you get into Milne harbour (Koluktoo) where you will find any amount of salmon in the river flowing from the west. Going north of Milne sound, give the east outside islands a good berth, and then keep midway in Eclipse sound, towards the Salmon river, where you can take salmon at high water."

Cross Navy Board.—June21st.—We marched Souty-East down Navy Board to Canada point—the dogs being up to their bellies in slushy snow and water—and had a hard time. The day was clear and fine with a north wind blowing. I could see the coast of North Devon quite plainly, fifty miles away to the north, across Lancaster sound, which was full of open water right across to the North Devon cliffs.

Canada Point.—We reached a small bay about a mile to the north of Canada Point, where we camped at 10 p. m.

June 22rd.—I spent the day which was fine and clear, looking for mineral inland and north-east of Canada Point. The hills to the north of the point consist of gneiss and rise 1400 feet straight out of the sea. Eight miles south of the point, the mountains recede for a distance of two miles from the shore, which consists of a flat, gravelly plain. To the south of this plain are two glaciers, from which a small stream flows into Navy Board. This stream is said by the Eskimos to have its source in a warm mineral spring which does not freeze in the winter months. Just north of the glaciers and about three miles back from the shore is a large deposit of lignite coal near the top of a hill about 600 feet above sea-level. On the top of one of these hills a member of the "Arctic" expedition found a large tree stump in good preservation, how it got to such an altitude is a mystery. The southwest corner of Bylot island consist of low, rounded sandstone hills which slope gradually into Navy Board and Eclipse sounds. On this day I shot a seal on the ice.

June 23rd.—I spent the day prospecting round Canada Point, as the dogs' feet were too sore to travel. The day was fine and clear, the sun shone warm overhead and a light breeze blew from the north. I killed another seal that was asleep on the ice.

Bluff Head.—When looking north from Canada Point, Bluff Head on the west side of Navy Board, the point at the northwest entrance just south of Adams island, and Canada appear almost in line.

June 24th.—A day of furious north wind, rain and snow. We made an early start and travelled from Canada Point across Navy Board in a south-westerley direction to Low point the dogs being all the time up to their bellies in cold slush and water, through which we had also to tramp. All the dogs had their feet cut and bleeding and some of them were unable to pull the sled at all.

Schooner anchorage.—Just south of Low point there is a small rocky islet, about 300 yards long and 150 yards broad, which is separated from the shore by a narrow channel some 300 yards wide. There should be a fine winter sheltered harbour for a schooner between this island and the shore, and a ship should approach the channel from the south side.

Eskimo Punishment.—Some years before, this island was the scene of an Eskimo tragedy or execution. An Eskimo who lived at Toolooria was constantly annoying the other natives by thefts of their meat, cutting their harness and other misconduct, until the rest of the band became so exasperated that they took him in a boat and marooned him in the small island. There they left him without food or arms, and, as he could not swim across the icy waters of the narrow channel, he perished of starvation. There happened to be a cache of seal and walrus meat on the island, but he did not know of it, or would have been able to subsist on its contents until the channel froze over, when he could have walked ashore.

Salmon Stream.—After passing low point we continued south along the west shore of Navy Board, past the village of Toolooria and camped about six miles south of that village. Near here a small shallow river, about 50 feet wide, empties from a small lake into Navy Board. The Eskimos told me that the salmon frequent the river and lake. The hills run due south from Toolooria with a narrow strips of flat beach between them and shore. At the mouth of the river the flat beach runs inland for about two miles.

Plague of Spiders.—We passed a most uncomfortable night as our clothes were wet through by the rain and myriads of small spiders swarmed out of the moss-covered gravel and crawled on our backs, over our faces and into our ears, which rendered sleep out of the question. The wind that night was very cold and we shivered all night in our wet clothes.

Inclement weather.—June 25th.—We remained here and I spent the day in exploring the neighboring hills for mineral, but could find no traces of any. The hills were composed of rusty gneiss, granite and mica schist and were about 600 feet high. It rained heavily all day, and a moderate wind blew from the northeast. The rain which was very cold soon wet us through. I killed a seal and a red-throated loon. We spent another miserable night in our saturated clothes, as the night was very cold and we were pestered all night by the small spiders that swarmed over us.

Navy Board Inlet.—June 26th.—We started early and continued our journey south down the west shore, of Navy Board inlet, which is about 65 miles long from north to south, with an average width of ten miles. We made about 25 miles that day and camped at the foot of a mountain at the south-west entrance to Navy Board.

A strong north wind blew all day, accompanied by fog, rain and snow. The ice on the sound was covered with slush and water, so deep that the dogs often had to swim. We tramped through this, knee-deep in the ice cold water and slush, all day and suffered intensely from cold and exposure. In the afternoon I killed a seal. We nearly lost one of the dogs that, being tired, lagged behind and was run over by the sled. We could only keep ourselves warm by keeping constantly moving; as the moment that we stopped the rain, cold and raw wind would freeze us to the bone.

When we reached our camping ground all our bedding and clothes were wringing wet, the sled having been often completely submerged.

Sketch bearings.—Each day I took careful notes of the relative bearings of the different headlands, islands and bays, by the compass and position of the sun, and at night made rough pencil sketches after my arrival in camp.

Anent provisions.—We spent another cold, damp, cheerless and miserable night. The provisions that I had brought from the ship were all finished and during the rest of the trip we lived on seal meat, ducks, and, when we could kill nothing, on moss and roots or anything that was at all edible. Had I known that the ice would have been in such bad condition and the consequent rate of travel so slow, I would have taken provisions enough to last a month. The tendency in the Arctic is always to underestimate the difficulties and probable duration of a trip, and influenced by the desire to make the load as light as possible, one generally take an insufficient supply of eatables. Weather conditions and the state of the ice are so variable and in such uncertain quantities in these latitudes, and game is so hard to kill that one should always take a good surplus of food, in concentrated form, to provide against storms, bad ice and other unforeseen contigencies.

West End of Eclipse Sound.—June 27th.—Making an early start, we experienced another day of continual hardship and discomfort. We travelled round the shore of a wide circular bay at the west end of Eclipse sound, which is about ten miles across from north to south and six miles deep. At the southern extremity of this bay lay the long and hitherto unexplored sound, the exploration of which formed the principal object of my trip. The dogs and sleds were constantly immersed in the ice-cold water that lay on the ice in large pools, and the former often had to swim. Tootillik rode on top of the sled, while Peewikto and I splashed alongside through the water, which wet us through and made us cold and miserable all day. East of the southern point of this bay is a small island which lies about a mile off-shore. Three miles further out, to the north-east, are two small islands, about three quarters of a mile apart, the larger and more easterly one is called, by the natives, Pizzi-tark-pin. We reached the entrance of the unknown sound about mid-day, and I named it Tremblay sound. On arriving at the entrance I took bearings and I found that the point at the north side of the entrance was in a direct line with the small islands lying a mile from it and with the extreme northerly point of Kai-joo-ark-to island which lay to the south-east, on the other side of Milne inlet. This point which I named Alfred point, is also in a straight line with and about due west of Belœil island and Albert harbour in latitude 72° 42′ 32″N. The entrance is about four miles wide and the sharp point on the south side I named Athole point. After passing the entrance the sound widens out to five miles, as there is a curved shallow bay on the north side, which extends in a westerly direction for about twelve miles. The sound then turns to the south-west and runs about twenty-eight miles in that direction, which gives the sound a total length of 40 miles. It is about 5½ miles across at the widest part, about ten miles from the entrance, and averages from 3 to 4 miles in width, gradually narrowing in towards the head. At the extreme south-western end of the sound there is a small bay, about two miles long and one mile wide, which is protected by a point and the entrance to which is half a mile wide. A river discharges into the head of this bay, which is completely sheltered from all storms and ice pressure and where a ship could lie in perfect safety during the winter. A few miles to the east of this point a fine salmon river runs into the sound from the west, and caribou, hares and ptarmigan are numerous in the neighbouring hills.

Overland trails.—This fine sound can be entered and navigated by the largest vessels for six weeks in the year, from August 15th to September 30th. From the end of the sound there is an overland trail, practicable for sleds in the winter time, to Koluktoo, and another across Borden peninsula to Moffet bay, which lies about 25 miles to the west. The Angokok, Pamikpa, told me that he had crossed, by this trail from Tremblay sound to Moffet bay in five days, by way of the Salmon river, and that there is only one day of hill climbing near Moffet bay. He evidently loitered along in leisurely fashion, hunting caribou on the way, and no doubt could have accomplished the journey n half that time. Another trail also practicable for sleds in winter-time, runs up the Salmon river valley through the centre of Borden peninsula to the head of Adams and Strathcona sounds.

The natives as a rule prefer to travel in winter round the coasts by the sounds instead of crossing the land even if it takes longer, as they can kill seal on the way for themselves and their dogs.

Rivers.—On the north side of the sound, the mountains rise like square walls from the waters' edge to a height of some 700 to 1500 feet as far as the first river which I named the Alfa river. The hills then become lower and more rounded and are cut by numerous deep ravines. The second river I called the Beta river, and the third river, which enters the head of the sound, the Gamma river.

Graphite mountains.—Between the Alfa and Beta rivers there are huge mountains, black as coal, that are heavily impregnated with graphite (black lead). From these hills I obtained samples of graphite, talc, mica schist, iron-stained gneise, copper and iron pyrites. There is evedently a large outcropping of Huronian rocks in this vicinity, near the mouth of the Gamma river, in a hill about 300 feet high, I found a large quartz vein, about 15 feet wide which contained copper and iron pyrites. This quartz was milky-white and rusty in appearance. The mountains at the head of the sound, for the last ten miles, consist of these black, graphite hills, cut by numerous quartz veins and seemed to extend inland for a distance of ten miles.

We camped on the north side of the sound, about fourteen miles from its mouth, on a small, flat gravel beach about 400 feet wide, back of which the mountains rose straight up to a height of 1200 feet.

Our clothes were wringing wet by the constant rain and snow, and we passed a cold, sleeples, shivering night.

The dogs' feet were bleeding from the cuts by the sharp ice and only about four of the poor animals were able to pull at all, althought fortunately the load on the sled was light.

June 28th.—We started early down the sound, amid rain and snow, with a strong north-east wind blowing, which swept down the narrow, high-walled sound like an ice-blast that chilled us to the bone. The footsore dogs had great difficulty in pulling the sled-sometimes they would have to swim through the large pools of water that covered the ice. On the narrow beach near the mouth of Alfa river I came across the trunk of a balsam tree, that was about 15 feet long, and one foot in diameter, with long roots attached that had been bruised and torn by the ice-floes. This log must have come all the way from the Gulf of St-Lawrence or Hudson's Bay, up the Greenland coast, across Baffin bay and then, being caught by the ice, have been blown by the east winds throught Lancaster strait, down Navy Board and into the sound. One of our party found on the south shore of Bylot island a large tree-trunk of red-wood, corresponding to mahogany from the description, which may have come by the gulf-stream and then by the same route and in similar fashion, from Cuba or the West Indies.

Alfa River.—The Alfa river runs into the sound through a deep valley one or two miles wide, between high mountains. It rises in a lake to the north-west, and its bed is from 100 to 300 yards wide with low banks that are only a few feet high. When I visited it there was a stream of water running down the riverbed about 30 feet wide and two feet deep. The bed was full of small rapids, boulders and gravel with very little sand. I noticed numerous small ducks and King Eiders swimming in the open water near the river mouth, which led me to the conclusion that salmon and other fish must freequent the mouth of the stream. I shot two ducks here. A little further on I killed a very large seal that was asleep near its hole on the ice. We camped on a small gravel beach about three miles south-west of the Alfa river. This beach ran back about 3 or 400 yards to some small hills at the foot of some high mountains.

We were, as usual, wet through, chilled and tired out and the dogs were all limping, footsore and worn out with pulling the sled through the water and thick slush. In the middle of the night a north-east gale sprang up, accompanied by whirling clouds of thick, wet snow. Our tent was blown down by the storm and we all got wetter and colder when putting it up again.

Beta River.—June 29th.—The wind shifted to the north-west in the morning and blew a gale all day, with a heavy snow-storm in the afternoon. I spent the day walking over the hills between the Alfa and Beta rivers, studying the rocks and formation of the country. I walked inland about ten miles from the camp; then west and back to the sound along the high-hill-tops that bordered the east bank of the Beta river. I saw plenty of water running down this river, which runs east and west down a deep valley, one to three miles in width. The Beta valley is flanked by high mountain chains on each side. I saw plenty of small long-tailed ducks swimming at the mouth of the Beta river, which is a fine salmon stream and which the Eskimos used to frequent many years ago. On a small point south of the river mouth are the remains of an old Eskimo encampment, consisting of old stone and earth igloos that were built about 20 feet above the waters of the sound.

I reached the camp about one o'clock in the morning, in a howling snow-storm, wet through, cold, tired and hungry. About two miles north of the Beta river I passed another old Eskimo encampment of old stone igloos which were situated on a point of black, rusty rock about 100 feet above the sound.

We passed another wretched night, shivering with cold and wet through. It blew hard and snowed all night.

June 30th.—The wind blew hard all day from the north-west accompanied by torrents of rain and snow. In the afternoon the wind veered to the north.

Leaving Tootillik in camp with half of the dogs that could not travel on account of sore-feet, Peewikto and I took the sled with five dogs and started out to visit the head of the sound, as I wanted to sketch it and see the rock formation. The ice on the sound was covered with water and made it hard travelling for men and dogs; and we had to travel knee-deep in ice-cold water and heavy sludge most of the day. When we reached the mouth of the Gamma river, I saw seven caribou on top of a hill about three-quarters of a mile away to our right. Peewikto went after them with my 280 Ross but could not get near enough for a shot. I spent the day in examining the rocks and making a cairn on the beach at the south side of the river mouth, in which I placed a record in a cartridge case with a note of the date of my visit and marked the spot with a board on which my name was cut.

Just before reaching the Gamma river, the dogs, when they caught sight of the caribous made a furious dash in their direction and capsizing the sled, knocked me off the ice into the deep ice-cold water of the sound, at the river mouth. The strong current carried my legs under the ice and I was for fully fifteen minutes struggling in the icy waters of the sound and was fortunate not to have been attacked with cramps. Peewikto had started away after the deer and I had only the dogs for company, and they kept coming and sniffing and whining to the edge of the ice as if they wanted to help me. My fingers would slip on the edge of the ice whenever I tried to pull myself out. Eventually I managed, with the aid of a fragment of loose, floating ice to paddle across fifty feet of water and to clamber out on the ice where it was thinner and I could get a better grip. As I climbed out on the ice I lay there gasping for breath for several minutes, and my teeth chattered all day with the cold of my wet clothes. It was a close call and came near to ending the story.

The Gamma river.—The Gamma river enters the small bay at the head of the sound and flows down a broad deep valley, one to three miles wide, from a lake to the south-west. The valley is flanked by high mountains on each side. The riverbed is of gravel, quite free of large boulders. The stream of water that flowed down the bed was about 30 feet wide and from two to three feet deep and ran down a series of small rapids to the bay. Seeing no ducks or gulls at the river mouth I concluded that it contained no salmon.

A large quartz vein.—On the north side of the river I found many veins of quartz, which traversed the rusty gneiss and mica schist in a westerly direction and which dipped to the north at an

1—The midnight Sun.
2—Hunting Polar Bear in Kayak by the Eskimos.

angle of 45°. One of these quartz veins measured fully fifteen feet across and contained an abundance of iron and copper pyrites and mica. The vein ran from the shore of the sound into the centre of a high mountain that was about 1200 feet high. At the mouth of the river I saw traces of an old Eskimo camp.

In the afternoon the wind increased to a hurricane and was accompanied by furious storms of rain and snow. When Peewikto returned from his fruitless chase after the deer we travelled back to camp which was about ten miles up the sound and arrived there about 11 o'clock at night. We found poor little Tootillik in tears as she was alarmed at our long absence and was frightened at being left all alone in the storm.

The tent was split in several places by the force of the wind and the rain and snow pelted in on top of us. We had no fire to dry our clothes and, having no change, had to stay in our wet clothes all night. Our tea consisted of raw seal. We passed another miserable night and were nearly frozen. Peewikto and I sat back to back all night with our teeth chattering and shivering in every limb. Tootillik cried most of the night as she feared we were all going to die of cold and starvation before we could reach Salmon river.

Bellevue Mountain.—July 1st.—The storm abated and the day was fine and clear, with grey clouds obscuring the sun. A moderate cold wind blew from the north. It was the first fine day we had had since leaving Canada point. Peewikto and I walked six miles inland from the camp to the north and I climbed a very steep mountain, about 1500 feet in height, on the south side of the Alfa river, as I wished to get a good view of the whole country and this was the highest mountain in the neighbourhood. I had terribly hard work to climb up its steep sides, as the hill was bare of snow and covered with treacherous slides of gravel and boulders that kept slipping and sliding down under my hands and feet. Peewikto would not face it and said I should be killed if I attempted it. So he remained below when I climbed, and shot a hare with my rifle.

The top of the mountain was quite flat, covered with small gravel and snow and about 300 yards long on top. The mountain itself seemed to be composed of a hard, slatey limestone all stained and rusty, which seemed, to be the characteristic formation of the hills of both sides of the sound.

From the summit I obtained a magnificient view of the country in all directions. To the north-east I could see the entrance to the sound, the three small islands outside and the magnificient blue-black snow-capped peaks of Bylot. Almost due south, opposite the mouth of the Alfa river, across the sound, I viewed the valley by which the Eskimos travelled overland from Tremblay sound to Koluktoo and Milne harbour. I had a splendid view of the valleys of the Alfa, Beta and Gamma rivers and saw depressions in the first two valleys where I supposed lay the lakes from which they took their source. To my extreme west lay the extensive region of coal-black, graphite mountains.

I had very hard and dangercus work to descend the mountain which I named Bellevue mountain.

Peewikto and I then returned to camp which we reached about 9 p. m. and passed a somewhat better night. We dined luxuriously off the hare that Peewikto had shot, eating it raw as we had no seal blubber for the stove. We were also greatly cheered up by the improvement in the weather, by the good meal and at the prospect of starting back for Salmon river in the morning.

Start for home.—July 2nd.—Making an early start we travelled up the sound, along the south shore and splashed through ice-cold water all day that reached to our knees. The dogs were very foot-sore and the day was fine and clear, with a strong cold wind blowing from the north. We saw the sun for the first time in many days. We camped that night at 8 p. m. on the south shore about four miles from the entrance. We passed a somewhat better night, although our clothes were still wet through and we suffered greatly from cold in consequence. In the middle of the day I killed a small seal.

July 3rd.—We remained at this camp all the next day as I wished to kill some seal, if possible, to feed ourselves and the dogs. Peewikto and I walked all day knee-deep in the water that covered the ice looking for seal. We saw many, but could not get near enough to shoot them as cn our approach they would instantly dive through a hole in the ice into the sound. Unless you shoot a seal in the head and kill it instantly, it will, no matter how badly, it is wounded, dive through its hole and escape. And it is no easy matter to get a shot at the head as they often have it sheltered by their back and it is a small mark to aim at in any case; especially when one is shivering with cold, wet through and cramped from carwling several hundred yards through the icy water and slush that cover the surface ot the frozen sound.

We returned to camp in the evening, without having been able to shoot anything and, were shivering with cold, wet through, tired out, hungry and dispirited.

Cross Milne Inlet.—July 4th.—We made an early start and rounding Athole point, crossed the entrance of Milne inlet on our way back to Salmon river. From the start we were walking knee-deep through water that lay on the ice in great pools, and the dogs were swimming half the time. When we were half way across Milne inlet the north-east wind increased to a gale and was accompanied by driving snow and bitterly cold rain, which added to our discomfort. The farther we travelled the deeper became the pools of water on the ice, and the last part of the journey was through a large lake, with every here and there a small projection or mound of ice topping the water. This water was caused by the melting of the snow and the heavy rains that had been unable to escape through the ice into the sound; when the high tides at full moon would cause great cracks to open up in the pans, all this water would disappear. There were two weeks yet before the moon would be full.

The surface of the ice was uneven underneath the water and we would keep stumbling into holes where the water reached to our waists, and the dogs would have to swim and pull the sled from one hummock to the next, and they half drowned each other, when swimming in their harness, and from scrambling on each other backs. Poor little Tootillik bobbed about like a cork on the top of the floating sled, and we were all wet through and shivering with cold in the chilly wind.

We were kept busy all the time hauling the struggling dogs and the sled out of the deep holes and were wet through from head to foot.

Immiggin island.—Passing round the north end of Immiggin island, we travelled south down the channel between that island and the island of Kai-joo-ark-too and camped after a long, trying day on the mainland, a few miles south of what I named West point. It was impossible to camp on the ice on account of the water.

West Point.—In the granite rock at West point I came across a number of horizontal veins of quartz which varied in thickness from five inches to 2 feet, generally running north and south with a few cross veins, and which contained iron and copper pyrites.

Milne Inlet.—Milne inlet runs north and south for a distance of 50 miles between latitude 72° 40′ and 71° 50′N and lies between longitude 81° W. Its breadth varies between five and nine miles, and appears to be a southern prolongation of Navy Board inlet; and is shaped like a leg with a foot at the southern end. The sound runs towards the south-west for about 15 miles and then turns due south. On the east side of the entrance are the two large islands of Immiggin and Kai-joo-ark-too with narrow channels between them and the east shore; there are three or four smaller islands close to them. About 23 miles south of the entrance lies another large island, which the Eskimos called Kai-kiook-ta-soog-joo and which lies north and south almost to the centre of the sound, but a little to the west. This island is about ten miles long and four miles wide, and tapers at both ends. The western channel, between this island and Borden peninsula, is about two miles wide and the eastern channel, down which I passed in the "Arctic" drawing 20 fathoms of water, at the end of August, 1911 on our way to Koluktoo, is three and a half miles wide.

Toogar.—Opposite the island of Kai-kiook-ta-soog-joo on the east side of Milne inlet is a shallow bay, about five miles long from north to south, and which the natives called Toogar. In front of Toogar and close to the shore in the southern angle of the bay is a small peaked island. A small salmon river runs from a lake into the centre of Toogar bay; from here there is a sled trail, used by the Eskimos in winter time to the head of Arctic sound.

Koluktoo.—On the west shore of Milne inlet, about six miles south of Kai-giook-ta-soog-joo island, there is the large bay now called Milne Harbour after the Scotch whaler Captain who discovered it, and which the natives call Koluktoo. The distance across Milne inlet from the entrance to Koluktoo bay, and Toogar island is five good miles. The entrance to Koluktoo bay is about two miles across and the bay runs in a south-westerley direction for about 13 miles and widens out to about 4 miles. On each side of the bay lie high mountains which rise sheer out of the water to a height of 1200 feet. At the head of the bay is a large flat plain, through which the Koluktoo river flows from the south-west into the head of the bay. The Koluktoo river is both wider and deeper than the Salmon river, and flows into the bay through three separate channels, which come together about a mile and a half, back from the mouth. Two miles from the mouth the river flows through a narrow, rocky channel which has an abrupt drop of about eight feet and from which a good water-power could be obtained during the four summer months. About eight miles inland there is a lake where great quantities of the finest salmon spawn and eight miles farther inland to the south-west, are three more lakes. Caribous, Arctic foxes, wolves, hares and ptarmigans are abundant in the large plain and neighbouring hills, while seal and narwhal inhabit the waters of the bay.

Captain W. F. Milne, commander of the Dundee steam whaler, Esquimaux, was the first white man to enter Koluktoo bay with a ship and he proceeded to the head of navigation at the south end of Milne inlet, which he estimated to be in latitude 71° 40′N. He reported finding the ribs of a whale about 100 feet above the shore-level on the west shore which had probably been carried there by the pressure of the ice-floes, when pushed up the cliffs in a gale of wind.

There is deep water in Koluktoo bay and the "Arctic" in 1911 anchored about two miles north of the river mouth where a ship can find any depth of water she requires. The head of the bay is sheltered from all winds save the north-east and east winds that sweep down the sound like a hurricane, with the result in wintertime that the bay and adjacent beaches are soon swept bare of snow.

There is a native encampment about two miles from the mouth of the river, on the north side; and William Le Bel and Chassé built, in the winter of 1912-13, a small wooden shack, six feet long, wide and high, near the river mouth on the south side from which they trapped foxes round the shores of the bay.

The Eskimos travel occasionnally across Borden peninsula by sled trail, in the wintertime from the Koluktoo lakes to Scheming at the head of Admiralty sound. Koluktoo river is about 150 miles from Albert harbour.

South of Koluktoo bay, Milne inlet runs south for about 17 miles and ends in a boot-shaped bay, about six miles wide and six miles deep, into which the Peewikto river flows from the south-east, from which point the trail runs overland to Murray Maxwell bay and Igloolik. The Peewikto river is full of high falls and rapids and contains no salmon.

About 12 miles to the south-east of Koluktoo bay, on the east shore of Milne inlet, is a deposit of copperpyrites from which samples of native copper are said to have been obtained.

Scanty Fare.—July 5th.—A fine, clear day with the sun shining warm and bright overhead, and little or no breeze. We left West point early in the morning, and resumed our wet, cold, and tiresome journey over the water-covered surface of the sound. We followed the south coast of Eclipse sound in a south-easterly direction, and were wading and sometimes swimming in ice-cold water all day. We had nothing to eat the previous night, and having no seal meat, chewed some moss and roots which we found near the point.

Owri-tibbi island.—After rounding West point, the coast ran in a straight line to the south-east for about 30 miles as far as the entrance of Arctic sound. About seven miles to the south-east of West point there is a break in the shore-line formed by the island of Owri-tibbi, which is about ten miles long and four miles wide. The island is surrounded by a channel, on its west and southern sides, which is about seven miles wide and 17 miles long. The eastern end of Owri-tibbi island forms the entrance of Tonga sound, which penetrates the land in a southerly direction for about 15 miles. Mr Reader visited Tonga sound with the Eskimo, Tonga, on October 30th and 31st, 1912, which is about west by south of Salmon river. The entrance is about a mile wide with a rocky islet in the centre. The sound gradually widens to three miles across and runs between high walls of crumbling gneiss about 700 feet high; eight miles from the entrance it opens out to eight miles wide and ends in a boot-shaped bay about ten miles wide, from east to west, and about five miles deep. To the south of Tonga sound the country stretches away, as far as the eye can see, in a succession of low, sloping rounded hills, in which are found large herds of caribou and foxes, hares, ptarmigan and weasel.

The Weasel.—There are thirty-five species of weasel in the world, of which 23 are found in America, and they are found all over the world, in all latitudes. They are the smallest and at the same time the most courageous, persistent and blood-thirsty of all the carnivorious animals. They are only 8 or 9 inches long including the tail, which is about two inches and a half long. They have very short legs, armed with very sharp claws and they resemble in miniature to a tiny polar bear.

The Arctic weasel of America corresponds to the Ermine of Russia, Sweeden and Norway, although the skin is not so valuable. In summer the fur is reddish-brown in colour, in winter it turns to a pure white, slightly tinged with yellow under the belly. The tip of the tail remains a brillant, glossy black, and the hair is longer and more abundant in the wintertime. They change their coat when the snow melts in the spring, and in the fall the fur turns white. Hares, ptarmigan and lemmings form their principle diet, which they chase with remorseless agility and determination. They also catch fish in the summertime as they are excellent swimmers. They progress over the snow in a series of bounds and it is surprising the distance these fierce little animals will cover at a leap. They are very curious and are quite fearless and when in numbers will even attack man. A single weasel has been known to destroy forty fowls in a night and they are the mortal enemy of rats. They can readily be tamed and become great pets. In a natural state they will live to the age of ten years.

The weasel live, as a rule, in pairs and find their home in holes in the ground. The female gives birth to two to twelve little ones in the month of May, which she cares for with great tenderness until the following winter, when they are sufficiently skilled in the arts of the chase to hunt for themselves. The young ones are very playful and indulge in all kinds of play and exercise to develop their muscles and jumping powers. They are very useful and ornemental animals, but, when hard pressed or attacked will emit a liquid with a very desagreeable and penetrating odour.

High hills.—Between Tonga sound and Arctic sound are the highest hills in the neighbourhood, as they ascend in great, gloomy escarpments to a height ot 2000 feet.

During the day several of the dogs were nearly drowned in their harness when swimming, attached to the sled, across the deeper water-holes. We would often fall up to our necks into deep seal holes in the ice. The wooden sled was just buoyant enough to support Tootillik, but she was sitting in ice-cold water most of the time and often cried with fright and cold. It was a most trying and most dangerous day's journey owing to the rotten condition of the ice; and we had a wonderful exhibition that day of the toughness and courage of the Eskimo dogs.

Kai-nee-pee island.—In the morning I killed a small seal in a crack in the ice and we gave ourselves and the dogs a snack before starting. We ate nothing all day and had a small meal of raw seal meat after arriving at our camping ground on Kai-nee-pee island, where we arrived about midnight wet through, hungry and tired.

We were all wet to the skin and having no fire or dry clothes, shivered all night with the cold, in our sleeping bags.

July 6th.—I explored the coast of Kai-nee-pee island during the day, almost circum-navigating it. I made notes and pencils sketches of its dimensions, formation and position. The island is in the shape of an equilateral triangle, the sides of which are about eight miles long and the base of which faces Bylot island; the apex abuts on the entrance to Arctic sound. The island is composed of granite-gneiss, and I found some quartz-veins on a point in the centre of the north shore. These quartz-veins were three and four feet thick and ran in all directions. They contained no mineral, and were mixed with black mica.

On each side of Kai-nee-pee island are two narrow channels, about a mile wide, that lead into the three long, narrow sounds that form Arctic sound. There are three small rocky islands that lie south and south-west of the island, and another that lies due west of Kai-nee-pee island, in the centre of the broad channel between its west shore and the mainland.

Arctic Sound.—Arctic sound, the entrance of which is about 56 miles distant from Albert harbour, is composed of three narrow sounds which penetrate the mainland of Baffin island in a south-easterly, southerly and south-westerly direction. These sounds are known to the Eskimos as Tooneen, Kai-nai-yook-too and Ir-kud-loo-in (the place of salmon). Tooneen the more easterly branch, is about thirty five miles long, and from three to four miles wide. There is a fine salmon river flowing into the head of the sound from a couple of lakes to the south-east. The central arm, Kai-nai-yook-too, is about 20 miles long and two miles wide with a large lake near its eastern shore, which discharges by a short stream into the sound. The natives rarely visit Kai-nai-yook-too as they say there are no salmon in the river.

Ir-kud-loo-in.—The more westerly branch of Arctic sound, Irkud-loo-in, is about 25 miles long and four miles wide. It opens out at the end into a large pear-shaped bay which is about ten miles wide and nine miles deep. This bay on the south shore is subdivised into two smaller bays into each of which flows a nice salmon river. The easterly of these bays is called by the Eskimos, A-rak-pee and the westerly one they call Ir-kud-loo-in on account of the number of salmon that the river contains.

The Ir-kud-loo-in river, a few miles above its mouth, branches into four separate streams which have their source in five lakes, which are the sprawning places of thousands of arctic salmon. On the west shore of this arm of the sound, is another small river and lake where Peewikto informed me he often used to catch plenty of salmon in the summertime. At the head of Ir-kud-loo-in sound is an old stone igloo which the Eskimos use when hunting caribou in the winter in the hills to the south.

In summertime the Eskimos will wander in search of caribou and birds, over the land, from the head of Arctic sound to the Clyde river, on the east coast of Baffin land, a distance of 300 miles. From the Clyde river they have crossed Baffin land to east coast of Fox channel.

Rotten ice.—In the afternoon I hunted after seal but could not get near them on account of the water on the ice and the dangerous condition of the ice which was disrupted in many places by the swift currents flowing in the narrow channels each side of Kai-nee-pee island.

July 7th.—A fine but foggy day. We started early in the hope of reaching Salmon river which was about 30 miles away to the east from our camp. But the ice was so rotten in front of Oliver sound and so full of holes, that we kept constantly breaking through, men, dogs and sled-until it finally became so bad that we could proceed no further. We had the greatest difficulty in getting to the shore, as the thin, black, rotten ice near the shore kept breaking under our feet and letting us into the water. The ice along the shore had wasted away near the land, under the action of the sun, wind, high tides and the strong currents that swept out of Oliver sound. Many times I thought that we would all be drowned, but at last the dogs leapt off a moving pan into the water and, swimming, dragged the sled ashore. We followed suit and managed to reach the shore, wringing wet, cold and completely exhausted with hunger and fatigue, but thankful to be once more on solid ground and off the treacherous pans. It had been touch and go with us many times during the day and Peckwito said the Eskimos would never have taken such chances in travelling over such rotten ice as we had done.

Schooner anchorage.—We pitched camp about midnight in a small bay about five miles north of the entrance to Oliver sound. There is a small island in front of this.bay about 200 yards off the point, and between the island and the shore, would be a good anchorage for a schooner or a small vessel.

Nothing to eat.—We had been unable to kill any seal and had eaten nothing since the morning of the sixth, nearly 48 hours before, and were consequently faint with hunger and exhaustion and our teeth chattered and limbs shivered from our wet clothing. We ate some moss and roots which we gathered on the shore and slept a little.

Oliver Sound.—Oliver sound lies about 45 miles south-west of Albert harbour and penetrates Baffin land in a south-easterley direction for about 25 miles. The head of the sound lies about due south of the mouth of Salmon river, from which it is distant about 25 miles as the crow flies. The sound is about three miles wide, and is bordered on the north by a high, rocky ridge of hills that run out to a long rocky point near the entrance. On the south shore of the entrance is a very high, square, bluff, rocky mountain, about 1000 feet high, on the top of which is perched an old stone Eskimo igloo. Peewikto gave me this information as he had visited it. How this igloo came to be built there, is a mystery, as the Eskimos invariably build their igloos close to the water so as to be able to hunt seal and narwhal in the waters of the sound. It would almost seem as if some gigantic upheavel, at no very distant date, had thrust these mountains bodily up from the bed of the ocean, as marine shells can be found on the top of most of them.

There is a salmon river running from a lake into the head of Oliver sound, but the Eskimos rarely go there, prefering Arctic sound as a place for salmon fishing and caribou hunting.

July 8th.—We could not kill any seal as the ice along the shore was too rotten to allow us to go out on the sound after them; and we had no boat. So leaving Tootillik to mind the dogs and sled, Peewikto and I started off to walk along the shore to Salmon river which was about twenty miles away. We left her Peewikto's Mauser rifle and my Colt automatic pistol with which to kill any ducks or rabbits that might happen along, as there was nothing to eat and neither we nor the dogs had eaten anything for 3 days. As we could not drag the sled over the bare rocks, we decided that it was best for us to hurry to Salmon river and get a punt and some provisions so that we could transport dogs, sled and our baggage over the rotten disrupted pans. Tootillik cried bitterly when we left, but we told her that we would soon be back and bring her plenty to eat and some tobacco to console her.

We walked all day along the shore, stopping now and then to pluck and munch some roots and grass, and often falling down from sheer weakness. Our thin, wet seal shoes were a poor protection against the sharp rocks and gravel that lined the shore, and our feet soon became bruised, swollen and very painful as we stumbled along the rocky shore.

Reach Salmon river.—We struggled in to the Salmon river shack about ten o'clock that night with the sun shining high overhead and, in spite of our utter exhaustion and bruised feet, were terribly glad to reach good food and shelter once more. There we found most of the party engaged in fishing salmon at the mouth of the river with seines which they salted away in barrels.

After a good meal and a change of clothes we had the first good night's rest since leaving Ponds inlet 24 days before.

Return for Tootillik.—July 9th.—A beautigul, warm, sunny day with a genthe breeze blowing from the west that made life pure delight. After dinner, when the fishing party had finished with it, we took the flat bottomed punt, fitted with runners, and started back for Tootillik and the dogs with a good supply of fresh salmon, pork, biscuits, sugar and tea.

We pulled and pushed the heavy punt through the water and over the rough, broken pans of ice all the afternoon and all that night until we reached a point on the shore about four miles from where our camp lay. We were completely worn out and could push the punt no further. Packing the provisions on our backs we walked to the camp which we reached about noon on July 10th, having been before continually hauling and pulling at the wretched punt through and over the pans for 23 hours since leaving Salmon river.

We found poor little Tootillik inside the tent, tired and sick with hunger; as with the exception of two small thin ducks which she had managed to shoot she had had nothing to eat for four days. She wept when she saw us, but after a good meal of salmon and biscuit and a cup of tea, she felt better and we all went to sleep.

July 10th.—We slept only a few hours and then started back for Salmon river, at 3 o'clock in the afternoon. We had great trouble to drag the sled and the baggage along the shore and over the ice-pans for over four miles to the place where we had left the punt. When crossing the pans we would keep falling into the water up to our necks and the dogs were weak with hunger, having eaten nothing for five days. We had hard work to pull the heavy punt laden with our baggage and the heavy sled over and through the rotten ice, open lanes of water and loose pans along the shore. We spent the rest of the day and all that night over the dangerous and laborious task. We reached Salmon river the next day (July 11th) about 11 o'clock. The morning was calm and dull and it rained steadily all the time.

Near drowning.—When out on the pans in front of Salmon river I attempted to leap from one loose pan of rotten ice to another. The ice gave way at the edge as I jumped and I went into the water over my head. On coming to the surface I shouted for help, but there was no one near as the men were all inside the shack a hundred yards away and Peewikto was busy with the dogs and sled some distance out on the ice. The swift current from the river, that ran like a mill-race, carried my feet, legs and body under the pan and the ice was too rotten at the edge to bear my weight and kept breaking under my grip. The water was icy-cold and I thought I was done for as in a few moments I would have been swept under the ice. Fortunately Tootillik saw me fall in and called to Peewikto who came running to my assistance and all but feel in himself. He managed by laying flat on the ice to grasp my arm by the sleeve and with his aid I succeeded after much trouble in pulling myself out. I was in the water fully ten minutes and had Tootillik not seen me when I fell I should have been carried under the ice and no one would have known what had happened. To have perished so miserably, after coming through so many risks and mishaps, when in sight of home, would have been a strange irony of fate. I was so weak with hunger and fatigue of hauling on the punt all the previous night that but for Peewikto's timely assistance, I should have succumbed in a few moments more to the effects of the ice-cold water, and have been swept out of sight under the pans.

After a change of clothes and a good meal at the shack Peewikto, Tootillik and I pitched the seal tent on the sand near the shack and took a well earned rest.

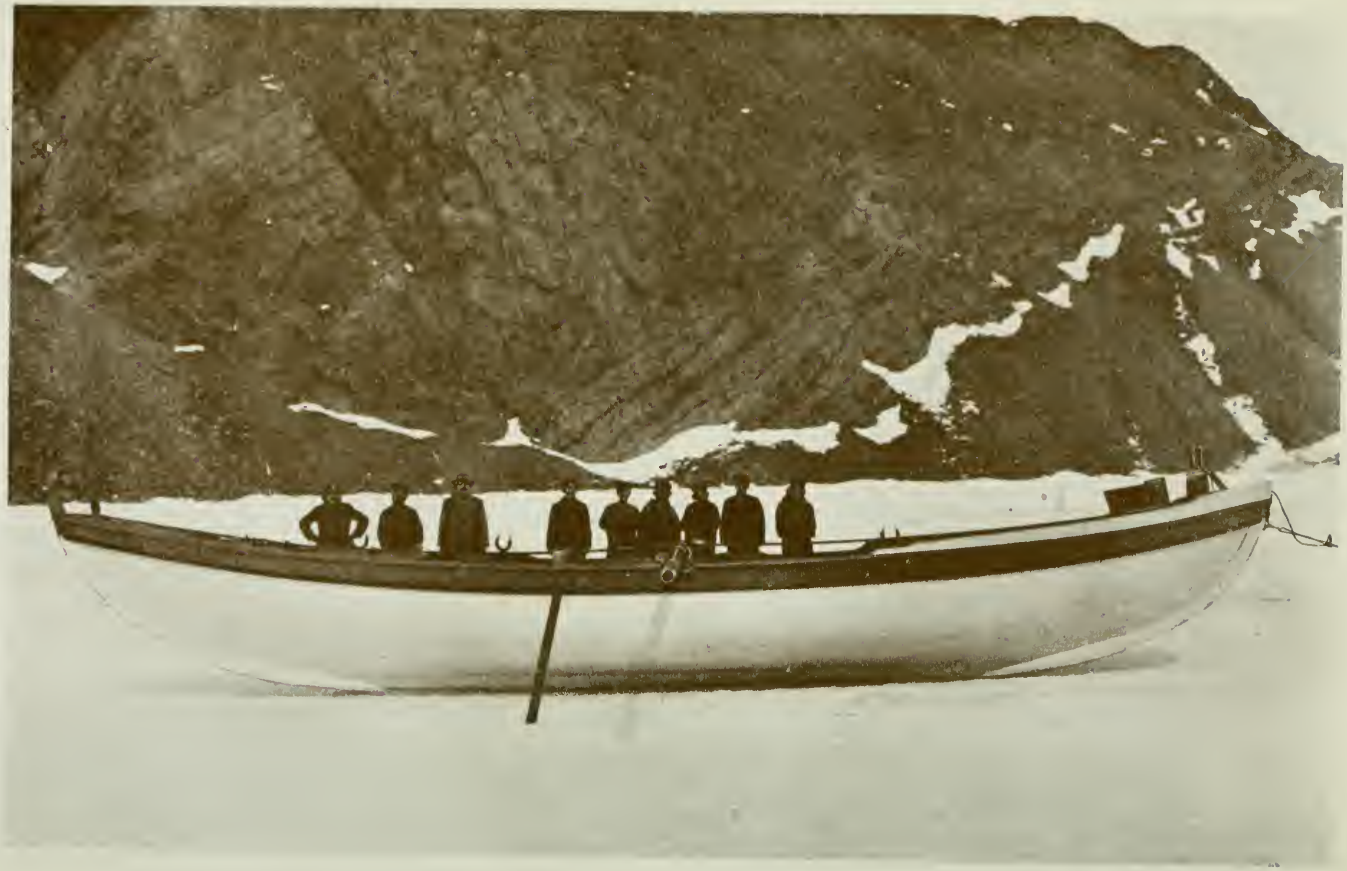
Thus ended the most unpleasant dangerous and trying trip that I had undertaken and had I known before-hand what was in store for us, would certainly never have undertaken it. The season was too late, and the ice on the sound is not safe to travel over after June 15th. Two days after my arrival the Eskimos could not travel with their sleds from Salmon river to Ponds inlet as the ice all over the sound was moving and braking |into loose fragments, which were thin and treacherous.

A well earned rest.—I remained at Salmon river until August 21ts, resting up after nine months of the most arduous travel and continuous hardship and suffering from cold and hunger. Peewikto, Tootillik and myself were all as thin as rails and wanted to sleep day and night. I suffered a great deal from headaches and toothache, as abcesses had formed under the teeth of my lower jaw; and I tried to obtain relief by poulticing them with hot mustard and pepper, with but indifferent success.

During these days we killed seal and salmon for ourselves and the dogs lazed about in the sunshine, recuperating after their long months of hard pulling in the sled and constant starvation. They were all lame with cut and swollen feet and it took several weeks before they were sound again. In October the poor brutes would begin the treadmill over again.

One day when visiting the old stone igloos at Killalucan point, a mile to the east of the mouth of the river, I caught a lemming with my hands, and as this curious animal forms the principal item of diet of many of the Arctic carnivores, it is deserving of a few words of description.

The Lemming.—The lemming belongs to the Arvicola family or campagnols and resembles a short-tailed rat, but they differ from the rat family in that their teeth have no roots and lie on the gums in a ziz-zag method. They are of a yellowish-brown colour with yellow feet and belly; the hair is long, very soft and thick, and turns white in winter. They are found everwhere in the Arctic regions of Canada, the Arctic islands, Alaska and in the northern mountains of Norway, Sweden, Lapland and Siberia. The Alaska type has black feet. They are very abundant on Melville island, where on the low, moss-covered area, the ground is penetrated in countless places by the entrance of their burrow. Their fore paws are armed with stout claws and a rudimentary thumb and a short rudimentary tail about half an inch long. The body of the adult male is about three inches long and the tail about half an inch long. Two of the fore claws, (the centre one) are doubled and well adapted to burrowing, which they do with astonishing rapidity, in the soft earth and sandstone hills. The hind feet have five long slender claws which are covered with a number of long hairs. The claws are light in colour and semi-transparent. The ear of this rodent is not like that of other animals, being merely an unprotected hole in the side of the head, with the exception that it is covered over with a reddish hair. The fur is soft and a dark-drab in colour mixed with grey and yellow. They burrow in the earth and snow, where they form little house for themselves with long underground tunnels of communication in which they keep restlessly moving about day and night. They live on lichen, moss herbs and roots and do not lay up any store for the winter. Where there is no reindeer-moss there are no lemmings. The female has four of five little ones at a litter. In Norway they occasionaly form in large bands and migrate to the south when nothing can stop their progress and they will cross any obstacle that comes in their path, even to swimming lakes and rivers. The Polar bear, fox, wolf, weasel, wolverene, raven, snowy owl and even the arctic hare wage constant warfare on the fat little wayfarer. They are very courageous and make great and creditable efforts to defend themselves when attacked, by standing on their hind legs or lying on their back, all the time beating the air with their tiny paws in an effort to wound their agressor; they also make use of their sharp, slender teeth in such a case. When attacked they give utterance to successions of squeaks and grunts which accord well with their fat, rolling body as it tumbles about endeavouring to keep off the



Whaling boat—Leaving for Button Point.

enemy. They readily resort to cannibalism when food is exhausted.

The lemming has always been a matter of great interest to the northmen and to the scientists. Olaus Magnus relates, in 1518, that these animals fell from the sky in a storm and torrent of rain and Wormius wrote a whole book to prove that they were born in the clouds. The Laplanders eat the flesh of the lemming.

Halcyon days at Salmon River.—The last six weeks that I spent at Salmon river, from July 11th to August 21st, were most enjoyable. The days were generally calm and clear with a bright sun shining overhead and with light breezes alternating from the east and west. The air was as invigorating as wine and the panorama of blue-black mountains surmounted by snow-capped peaks, the glistening sound, bright blue atmosphere and russet-brown hills was inspiring and unexcelled. Rippling stream sand rushing waters, the song of birds and the hum of insects filled the air with joyous music. Golden plover, King eiders, red-throated loons, snowflakes, Lapland longspurs, snowwhite geese, gulls, ravens, snowy owls, and longtailed jager were flying about everywhere; the river which flowed past the shack was full of the most beautiful salmon in the world and seal lay basking in the warm sunshine out on the sound. Great troops of narwhal would come plunging and blowing up the sound in full flight before a small band of voracious killers. There was no night as the sun shone over-head the day round. We had great sport spearing salmon and catching them even with our hands in a back pond at low tide; or in wandering over the hills after snow-white geese or golden plover. Occasionally a curious seal would pop its head and great, round enquiring eyes out of the water when taking a respite from its labours in pursuing the countless salmon and small fish that infested the mouth of the river; when there would be a rush for our rifles and then a volley would be let loose at the visitor; which sometimes would end in a tragedy and, more often, not.

Mitchell's grave.—Often, after tea, we would wander along the placid shore under the golden sunlight as far as Mitchell's grave and ponder on the calm and lovely splendour thatsurrounded that Arctic tomb, that lay so peaceful, silent and remote from the busy hum of men.

The grave lies about two miles to the west of Salmon river on a low, verdure-clad plateau, some fifty yards from the shore, with the feet pointing to the north and the sightless eyes gazing eternally at the Pole Star that silvern magnet of all things terrestial.

A wooden cross, painted white, bears the inscription: "Sacred to the memory of John Mitchell of Dundee, Engineer on board S. S. Esquimaux who died September 17. 1885, aged 49 years."

Leave Salmon River—On August 21st, we all left Salmon river in whale-boats which we pushed and poled through the ice-floes that still filld the sound and spent the night at the village of Ponds inlet, where we bade good-bye to our Eskimos friends with whom we had lived on such intimate terms during the past year.

Reward Peewikto and Tootillik.—Before leaving I gave my faithful and staunch companion Peewikto my 280 Ross rifle and 100 cartridges, my 303 Winchester and a number of cartridges, a large box of tobacco, a supply of powder, lead and caps and all the old clothes I could spare. To Tootillik, his plucky little wife, I gave my 45 automatic Colt pistol, several hundred cartridges some clothes and fancy ribbons and a supply of molasses, biscuit and pork; so that they at least would be able to pass a confortable winter While at Salmon river, we also helped them to catch and fill two large caches of salmon for their use in the winter. When at Iglolik I also bought six young, strong dogs which I presented to Peewikto; so that in the eyes of the natives, he had joined the ranks of the Arctic millionnaires.

They were very sorry to say good-bye and made me promise to come back to them again with my own ship, which some day I hope to do.

APPROXIMATIVE MILEAGE

Travelled by Mr. Alfred Tremblay, in North Baffin Land, from September 1st, 1912 to August 25th, 1913.

Expeditions	Miles	
Ponds inlet to Arctic bay	280	
Arctic bay to Scheming	150	
Scheming to Igloolik	200	
Igloolik to Aggo	200	
Aggo to Igloolik	230	
Igloolik to Melville Peninsula	175	
Lake Sarcpa to Igloolik	150	
Igloolik to Ponds inlet	450	
Ponds inlet to Lancaster Strait, Navy Board, Tremblay Sound, Milne inlet and Eclipse Sound	420	
		2255

LOCAL TRIPS

When Hunting, Prospectig and Exploring

Round Salmon river and Ponds inlet	300

Round Arctic Bay-70 days-Trapping	600	
Round Scheming-20 days	200	
Hunting on road to Igloolik	100	
Hunting and Exploring round Igloolik	150	
Hunting on Aggo Trip	25	
Exploring and Hunting round Murray Maxwell bay.	100	
Hunting and Exploring when crossing Cockburn Land	150	
Hunting and Exploring on Eclipse Sound Trip	150	
		1775
Total miles		4030

An average for 359 days of eleven and a third miles per day.

CHAPTER XII

THE RETURN VOYAGE FROM PONDS INLET TO QUEBEC

After filling the water casks we hoisted both anchors with the aid of a dozen Eskimos who had come from the village in their boats and kayaks, and, hoisting sail in a dead calm, managed to drift with the current through the western entrance of Albert harbour.

Leave Albert Harbour.—An easterly breeze sprang up about noon and the schooner under full sail began to forge slowly through the water "homeward bound". The Eskimos after a good meal, said good-bye and dropped into their boats which we were towing along-side. As we sailed away they stood up in the boats and, raising their caps, gave us three rattling cheers, to which we responded with another hearty cheer. The last we saw of them as the schooner tacked out of sight behind Belœil island, they were all sitting motionless at their oars, gazing sorrowfully after us and our hearts went out to the faithfull, brown-skinned people whose companionship and help had meant so much to us during the long, trying months of the past year.

We left Albert harbour on August 25th. and tacked back and forth all the afternoon against a stiff easterly breeze towards Button point. Eclipse sound, with the exception of a few scattered icebergs, was free from floes and there was open water ahead of us clear out into Baffin bay. We spent the afternoon clearing decks, lashing the boats and battering down the hatches in preparation for the rough seas that lay before us. We were all clad in sealskin coats and trousers, knee boots, shoes and mitts; the parting gifts of our Eskimo friends. These clothes afforded us great protection against the raw east winds and rain. The watches were set at 8 o'clock that night.

Greenland Coast.—We did not glimpse the Greenland coast until the afternoon of August 31st, as we ran into a succession of calms, fog and head winds. We saw no ice as we sailed across Baffin bay; but as we neared Greenland saw many large icebergs that had come from Melville bay.

On September 1st, we made good progress, when we ran down the Greenland coast at a seven knot clip before a north-west breeze accompanied by snow and sleet. The next day we were becalmed and sleet and rain felt in the afternoon. We noticed great quantities of feathers that had been dropped by the innumerable ducks and water-birds that infest the waters of Baffin bay, floating around us. It remained calm all that night and the schooner rose and fell idly on the oily swell. At midnight a heavy snow-storm fell and covered the decks deep in snow and we hoisted our side-lights in the rigging for the first time. The next day (September 3rd) was a beautiful one and the schooner bowled merrily along, before a north-east breeze opposite the island of Disko but out of sight of the land. In the afternoon the wind veered to the north-west and the schooner increased her pace to six knots an hour. In the evening we took in the staysail and the jib-topsail and ran between nine and nine and a half knots all night in the dark; keeping a good look-out ahead for icebergs. The vessel had been badly strained by her long stay in the ice at Albert harbour and we manned the pumps every two hours. The wind from the north-west steadily increased in strength with a big following sea. The night was starlit and cloudy. The sun rose over the eastern horizon at 4.30 a. m. the next morning (September 4th) when we saw a rare and beautiful sight. A huge iceberg with a large circular hole in the middle, passed between us and the slowly rising sun, and for a few minutes we enjoyed the curious spectacle of the pale golden orb shining at us, like a mass of golden flame, through the centre of the gleaming-white and glistening berg. It made a unique and inspiring picture. We were running then at ten knots an hour and at breakfast time both watches took a reef in the mizzen and mainsail as the wind was continually increasing in strength. At noon we took another reef in the large mainsail, and ran all that afternoon before the heavy north-west gale and sea which kept increasing in strength and violence. At tea-time we shipped a heavy sea over the bow, which poured down the foc'sle and broke the lashings of one of the boats on deck. The sky took on a deep, angry red and yellow colour, which bespoke more wind. The sea was lashed by the fury of the wind into clouds of spary and spindrift that whirled over the surface of the sea in all directions. After tea we took in the mainsail and jib and ran all night through the darkness and storm, under reefed mizzen and fore-top jib.

A furious gale.—On September 5th, the gale continued to blow with even greater fury and the heavy following sea became higher and higher. The schooner scudded along before it, all day, under reefed mizzen and fore-top jib, at eight and nine knots an hour. Both watches had a trying and anxious time during the night when peering into the darkness ahead of the flying schooner, on the constant watch for the ghostly, yellowish glare of the dreaded bergs. At noon we flew past a couple of large icebergs over which the mountainious seas were dashing and breaking a hundred feet in the air. We also passed a quantity of seaweed that lay in our track. At 3 p. m. we hoisted the main jib and ran through some dangerous chunks of ice, fragments of a large berg, one of which hit the schooner a glancing blow. At 4 p. m. the wind shifted to north by west and increased in fury; and we all realised that we were in for another dangerous and trying night.

The wind was blowing at least sixty miles an hour and the evening clouds were scudding past the setting sun at a great rate. As soon as a wave broke it was caught up by the wind and whirled away to leeward in great sheets of foam and spary. The gulls had hard work flying, to windward and would keep swooping under the lee of the giant waves for protection against the battering wind. At 6 p. m. we lowered the main-jib. At 7.30 p. m. we were aroused by a fearful racket overhead, and found that all our heavy water-barrels that were lashed on deck abaft the mainmast, had slipped their moorings and were careering over the deck and threatening to pound their way through the lee bulwork into the sea. Had they brooken the lee rail and rolled overboard our position would have been a bad one; as, we were at least two weeks sail from where we could obtain a fresh supply, and to have gone two weeks without drinking water would probably have spelled death for us all. All hands rushed to the rescue and, after a hard tussle, succeeded in morning the heavy casks with chains, once more to the deck, and we also steadied them with wooden chocks nailed to the deck.

A close shave.—At 11 o'clock that night, as the ship was driving fast before the gale in the blackest hours, Mr Reader and John LeBel, who were on watch on the bow, with Chassé at the wheel, saw a grisly, low-lying berg suddenly loom up out of the water ahead of the starboard bow and, as it seemed, right under the bowsprit. LeBel rushed off and shouted through the storm to Chassé, who, seeing the yellow glare over the bow and almost aboard, threw the wheel hard over with all his might, when the next wave would have dashed the schooner on top of the berg. The schooner, which was travelling very fast, answered her helm nobly and swung round so quickly that her bow missed the grisly, two-horned monster, by not more than a few feet while her counter, some fifteen feet from the stern, smashed into a projection of the iceberg, with a grinding crash, that broke in two planks in the starboard bulwarks. At first we thought, in the darkness, that the ship's bottom had been pierced, but, fortunately, the wound in the ship's side proved, on examination with a lantern, to be above water. It was a very close call; too close for comfort. We spent an anxious time on the lookout during the rest of the night, peering out over the bow into the inky darkness that was lit up every now and again by the milk-white phosphorescence of the breaking waves. So dark, was the night and so fast was the schooner travelling, one moment poised on the top of a huge wave and the next buried from sight in the deep through of the sea. that it was an impossibility for us to have avoided running full tilt on any berg that lay in our course. All hands heaved a sigh of relief when daybreak broke although the following day (Sept. 6th) was thick and foggy and the schooner continued to plunge and roll before the gale through a heavy cross sea, which made some of the party sea-sick. We were pumping the schooner every two hours, as her seams were opened by the straining of the heavy seas and clear water gushed from the pumps. A lot of rum was served out to celebrate our narrow escape from the iceberg on the previous night. We spent a wet, cold and uncomfortable day and worked at the pumps every half-watch as the strained hull was leaking badly. At 4 p. m. we shipped a heavy sea over the bow which flooded the narrow foc'sle where we slept cooked and ate our meals. That night the wind shifted and felt and the sea moderated so we hoisted the double-reefed mainsail and the main-jib and travelled fast through the night.

A head wind.—Early next morning (Sept. 7th) we hoisted the flying-jib and shook out the reef in the mizzen and, later, the reefs in the mainsail. A few hours later we were obliged to take in the two jibs and to again double-reef the mizzen and mainsail, as a furious head wind sprang out from the south with a heavy head sea. The ship pitched and rolled around like a drunken man; half of the crew were sea-sick and the pots, pans and cupboard doors banged about in the fos-cle, making an awful din. The old timber of the schooner creaked and groaned as though in pain as she pounded into the heavy seas. Later in the day we took in the mainsail and jib. At night the wind fell and it began to rain; the heavy sea keeping up all night. The plunging of the ship caused one of the wire stays that ran from the bowsprit to the foretopmast head to break and we feared that we should lose our bowsprit and topmasts. The bowsprit was old and dangerous to climb out on when handling and stowring the jibs.

The night was damp and dirty and the ship rolled like a barrel and it rained heavily from the south-east.

The next morning (September 8th) broke fair and fine with a light breeze blowing from the south-east. All hands were tired out with the strain of keeping a constant look-out for icebergs at night and with the continuous hoisting, lowering, reefing and handling of sails, and working at the pumps.

During the day the wind veered from the south-west to east, then to north-east and finally to north-west. It rained very heavily the whole morning and we were in our oilskins all day. We ran S. W. by S all day at seven knots and saw no ice. That night was dark and clear, with a north-west wind and heavy sea.

Fine sailing.—Next morning (September 9th) was beautifully bright and clear, and a west wind bowled us along on our course at 8 knots an hour, with all sails set. The sea was a deep blue and the sun was shining overhead. At 4 p. m. the wind dropped for a while, and revived and we made 9½ knots during the night. We passed two large icebergs in the afternoon, the first we had since our narrow escape on September 5th. We counted six whales spouting to windward, about two miles away. A beautiful sailing breeze kept up all night and we travelled fast. Several times during the night we had trouble in doggins icebergs and floating fragments of ice that would suddenly crop up ahead of the schooner out of the fog and mist. We were nearing the Labrador coast and the bergs were plentiful. That night we were treated to a wonderful display of northern lights that kept appearing, disappearing and reappearing in sudden flashes, covering half the sky.

Icebergs.—The icebergs at night appeared like dark-grey and deep misty-blue ghosts envelopped in a shroud of cloud-mist. In the day time, when it is foggy their approach is heralded by the thick, ghastly, yellow, glarish fog that envelops them.

A writer in the Montreal Star, writing on January 10th, 1914, from St-John, Newfoundland, gives the following interesting account of the icebergs that infest these waters and constitute such a menace to shipping:—"The year 1913 has been almost unexampled in the abundance of these crystal islands, and the early period of the season at which they showed themselves in such numbers. Towards the end of January their advance guard was sighted off the Newfoundland coast. During March and April these ramparts adrift were a constant menace to the big liners which, trying to make fast passages, had to risk more chances than mere freighters, so that more than one ocean greyhound came within an ace of meeting her end thereby. As early as March 20th the steamship Savoie, on arriving at New-York, reported sighting an icefield two hundred miles long floating directly in the path of incoming steamboats.

"These great flottillas of majestic icebergs have been for some months moving down across the Grand Banks, imperilling the safety of the ocean steamships which traverse that area, and in the spring forcing the first-class liners to abandon their accustomed tracks for areas further south while many a craft which arrived in port bore ghastly evidences of encounter with these silent but deadly destroyers of the deep or told of narrow escapes from their fangs.

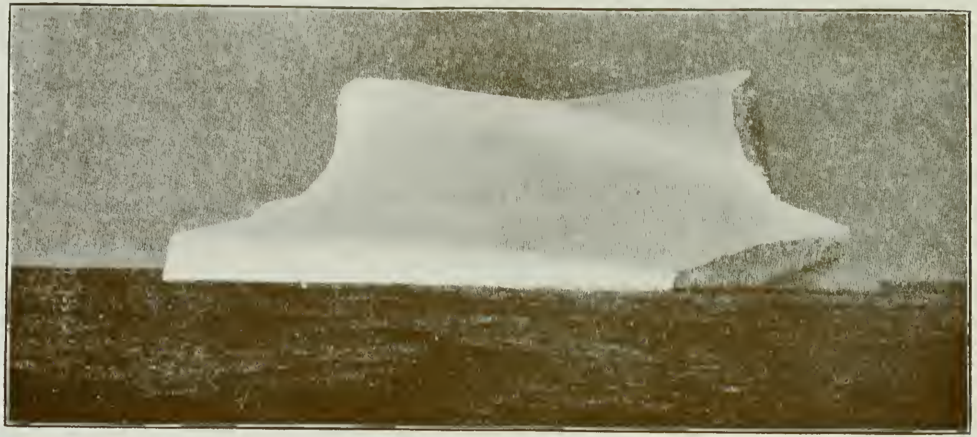
"All these icy masses which infest the North Atlantic steamer track have their origin in the frigid Greenland fiords, where mighty glaciers, real solid Niagaras, are formed from the vast ice-cap which covers that remote Arctic region and move resistlessly to the sea, where each summer they "calve" or give up enormous fragments which, dividing and sub-dividing again, become the bergs so much dreaded by the springtime voyager .

"These northern monachs are borne down in stately procession from the dreaded Baffin bay on the Labrador current, which sweeps past the eastern coast of Newfoundland, across the Grand Banks and into the Gulf Stream, where they gradually disappear under influence of the increasingly powerful rays of a more vertical sun and the higher temperature of the surface water.

"During their long journey down past Labrador and Newfoundland, the bergs do not remain of the same shape as when broken off the parent glacier or sundered again by internal fractures or grounding on reefs, but frequently turn a somersault to accommodate themselves to the changes centre of gravity of the berg.

The tallest berg.—"Admiral Markham, in his exploring cruise in Melville bay, counted between seven hundred and 800 bergs, all under way for summer climes and some of them exceedingly large. One of them he estimates to have been 400 feet high and 1800 feet long. This berg would have required no less than 1800 feet or 466 fathoms of water to float it. The tallest berg ever reported about the liner track was one observed by the steamship "Mineola", in June 1890, which was 450 feet from water line to summit. This berg would require water 3150 feet deep to float in. The Hafis, in May, 1892, sighted one which was 425 feet high. Bergs 150 to 250 feet high and 1000 to 1500 feet long are by no means uncommon along the Newfoundland coast, but they usually ground on the Grand Banks, are buffetted by storms, and split themselves into many lesser fragments.

Fog.—"These bergs are not dangerous in clear weather, because they can easily be made out when a long distance away, and can therefore be avoided; but from April till October the Grand Banks are almost always veiled in fog, and it is then that the menace of these ghostly wanderers most oppresses liner captains and mariners generally. Only the vigilance now enforced on the ocean grey hounds prevents terrible disasters, and even as it is many



Iceberg in Baffin Sea

Iceberg in Baffin Bay.

stout cargo boats are sent to the bottom every year from this cause.

Berg detection.—"Scientists have been trying to solve the problem of berg detection for sometime past, but without any practical application of the experiments thus far: and every ship that crosses the ocean nowadays has still to encounter this risk, with all that it implies.

The peril of liners.—"As an instance of the magnitude of the iceberg peril in recent years there may be mentioned the case of the Kaiser Wilhelm II, which on Saturday, April 9, 1905, counted thirty-two large icebergs within the range of vision. The Teutanic the next day sighted thirty-nine, and the Caronia two days later passed forty-six. The Toronto in the same week counted 72 between sunrise and sunset; the Majestic saw 56 about the same time, the Chemmitz dodged 80 or more of them; and the Minneapolis brought a report of 63.

Record of disasters.—"The Arizona in 1879, then the queen of the flyers, tore away her bow and came near sinking by striking a large iceberg off Cape Race in November, when most shipmasters thought the ocean was at last free of these pests. But now that the United States Hydrographic Office has taken to recording all the reports about these pallid wayfarrers of the waters, it is known that thy are to be found there every week of the year. The Arizona put into St-John's N. F., had her bow rebuilt of wood, and made her way to New York after taking 200 tons of ice out of her forepeak, where it had forced itself in the collision.

"Ten years previously in August, the steamer Vicksburg was sunk by collision with a berg in the same region, when 65 persons perished, and in 1863 the Canadian was also sent to the bottom by one, with a loss of 45 persons. The next July an immigrant vessel from Ireland to Montreal perished there by rammimg a berg and of 162 persons aboard her only four escaped.

"Another terrible tragedy arrived in May 1897, when the French fishing schooner Valliant plumped into a frozen wall on the Grand Banks, and seventy perished. Four survivors out of twelve who got away in two boats, were hardly able to keep themselves alive they being adrift six days and nights without food or water, and suffering dreadfully from frost-burn because of being unsheltered and only partly clad.

"Newfoundland mariners are always on the alert for bergs, because they are never absent from these waters, and even the vigilance and expertness of the hardy fisher-folk do not prevent many a fatality. The bark Nellie left St-John's one May morning two years ago, and before night fall there were only two survivors of the crew of ten, the vessel and the other eight having gone to the bottom through the ship hitting against a berg in a sudden fog.

"The schooner Albatross, with a crew of 22 seal men was never heard of after she sailed in March, 1903 and the general impression is that she struck a berg and went down. In April 1904, the steamer Grand Lake, while engaged in the seal fishery with 200 men aboard, rammed a big berg on the Banks, and narrowly escaped foundering and got back to St-John's with all her crew busily engaged pumping and bailing her out. A like mishap befell the Newfoundland, which was engaged in the same hunt, in April 1898, and her plight was even worse, for her sides were crushed by a floe as she tried to escape, and she reached port in almost a sinking condition.

"Sometimes even these staunch and specially built vessels are unable to withstand the contact with floes or bergs and within the last ten years, the Wolf, one of the finest of her class afloat; the Hope, which had an enviable record in Arctic exploration; The Mastiff, which had been built originally by the British Admiralty for northern work; the Resolute, a one—time Scotch whaler; and the Elliot—all succumbed to the terrible forces which nature exerts in this fashion, and it would require pages to tell of the mishaps to coasting and sailing craft in this region which have come to grief before these ice-monsters.

"St. John's is the haven of refuge every year for ships disabled by contact with bergs, which have to be docked for repairs to bows or bulks. In July 1897, the Concordia put in with her whole bow torn off by a berg, and only her front bulkhead to withstand the strain of forcing 200 miles through the ocean to reach a shelter. The Knight Bachelor was an almost identical case, and the Hatasu another.

"The John Bright, the Addington, and Rotterdam, and the Glenwet, to mention only a few, were similarly smitten. All these had to get wooden bows to continue their voyage. What small prospect of escape the crews of such crafts have is proven by the case of the Castlegate which in March, 1893, was crushed and sunk off Newfoundland, her men taking to the floe and being adrift thereon for two days and nights till rescued by the sailer Diana at the beginning of the blizzard which they could never have survived, for it battered the ice into chowder and would have overwhelmed them.

Narrow escapes of liners.—"Big passenger steamers frequently find themselves in dire peril from bergs, as was the experience of the liner Normannic, now the French flyer l'Aquitaine, on the Grand Banks on May 31, 1890, when having threaded her way through a wide array of bergs, she put on speed and was racing ahead till fog shut down. Then a crystal barrier interposed, which she escaped impaling herself upon only by the prompt work of her twin screws in opposite directions, causing her to spin round on her heel and just graze the berg with her side as she passed it.

"The City of Berlin struck a berg in a fog on the Banks three (3) years later; but fortunately was going at reduced speed else she would have torn her forepart asunder. Even as it was, her stern was telescoped, her forepart was shattered, and the falling of a hundred tons of ice about her decks made a wreck of all the gear and fittings from the bowsprit to the foremast. Her sister ship, the City of Rome, in September 1900, knocked off her stern below the water-line, leaving an aperture large enought to admit an automobile. The Swedish steamer Nordcap with 400 immigrants hit a similar berg off Cape Race in May, 1901, and sustained such damage that she had to put into St-John's to effect repairs This was also the experience of the French steamer Burgundia off St-Pierre, in March 1903 with 1000 French fishermen aboard, whom she was transporting to that port to engage in the cod-fishery, and of whom 12 perished by the dismanthing of the forecastle in which they were lodged.

"The Scale was another liner that rammed a berg, striking it a glancing blow as she swung round on sighting it: but the pressure of the mighty mass flung her over on her side until it was feared she would sink. Indeed, the coal in her bunkers ran over because of this, and she made port with a heavy list.

"The Portia when off Newfoundland in 1895 ran near a berg to enable some passengers to "snapshot" it; but went upon a sunken portion of the ice, disturbed its equilibrium and was being turned up out of water by the swaying mass, when her weight broke off the fragment which held her and she sank back into her native element again.

"Ths Caspian, with 550 immigrants aboard bound for Montreal near Cape Race in 1890, in a thick fog, drove against a berg, and shattered her bow so badly that she was barely able to reach St. John's, so fast did the water gain on the pumps.

"The Erl King in 1892, met a like mishap when entering Belle Isle strait with 725 immigrants, and had to make this port stern first to relieve the strain on her leaky forward end and bulkhead.

"The French liner Gascogne with 600 aboard, came near being overwhelmed by ice on the Grand Banks in April 1898, having been caught there with a broken shaft, and was in extreme peril for several days, until the floe swept her bodily southward into warm water and was then dispersed by a stiff breeze, which set her free.

"The German liner Bulgaria, in 1901 was compelled to seek harbour at St. John's with nearly 1000 passengers, having injured her propeller amid the floes."

The Titanic.—But the greatest disaster and tragedy of them all, and one of the most recent, was that which happened to the White Star liner, "Titanic", the largest steamship in the world, when making her maiden voyage from Liverpool to New York in April 1912. At eleven o'clock at night, when several hundred of miles south-east of Cape Race, she steamed at full speed into a field of large icebergs, and although she swumg round on sighting them, side-swiped her bottom plates the whole lenght of the ship against an under-water projection of a huge berg, and in two hours went to the bottom, in water two miles deep, when only 700 out of the 2300 souls on board were saved in the boats. Other ships attracted by the Marconi wireless signals for help arrived on the scene the followins morning and rescued the survivors from the boats.

From the foregoing list of disasters, an idea can be formed of the dangers that beset the Labrador, Greenland and Newfoundland coasts from these death dealing and treacherous foes to navigation and the benefits that would be obtained by an extension of the wireless observatories along the Baffin land coast as far as Lancaster strait and Smith sound.

The Labrador coast.—At daybreak of September 10th, we came abreast of seven rocky islands that lie off the coast of Labrador. The sight was a pleasant one as it showed us that we were approaching home waters and we were all throughly tired of the tedious voyage.

For two days (Sept. 10 and 11), we enjoyed beautiful calm weather, with a warm sun, blue sea and light head breeze that kept us constantly tacking to windward and keeping a sharp lookout for the large bergs that lay around. The nights were calm and wringing wet from the damp, penetrating fog that rose up from the sea. As we drew near to the coast of Labrador we had to kept a sharp look out for rocks, ships and bergs. The sunsets were specially gorgeous at this time of year, as the fiery golden orb of the sun sank behind the sombre rocky islands off the Labrador coast into a blue-black sea and the pale moon, ¾ full, rose at the same time in its silvery splendour and illuminated the Eastern sky.

Belle Isle.—We were slowly working our way towards Belle-Isle, and at 4 a. m. on the morning of September 12th, heard the deep booming bellow of the steam siren on the eastern end of the island, piercing the fog ahead of us, about two miles on the port bow. Hoisting gaff topsail and jib-topsail that were wringing wet and heavy to handle with the damp, dripping fog, we squared away before a light north-east breeze and ran into the strait. The fog was so thick that we could not see 50 yards from the schooner the water was smooth and the breeze very light. We had taken exactly the same number of days to cover the distance between Ponds inlet and Belle Isle strait as on the previous outward voyage 17 days.

About noon we heard through the fog, on our starboard side, the muffled roar of heavy surf pounding on the rocks and altered our course to keep away from the north-shore. The breeze freshened and we were soon running seven knots an hour under full sail through the dense obscurity of the fog, in the hope of being able to pass through this narrow and dangerous passage before nightfall. The strait of Belle Isle separates Newfoundland from the Labrador coast and is about 90 miles long, from the outer end of Belle Isle island to the Bay of St. John, and from nine to ten miles wide.

Peary writes the following account of his passage through the straitsof Belle Isle, in his very interesting book The "North Pole": 'In passing through the Straits of Belle Isle, "the Graveyard of Ships", where there is always danger of encountering icebergs in the fogs, or being swung upon the shore by the strong and capricious currents. I remained up all night, as any man would who had care for his ship. But I could not help contrasting that easy summer passage (on July 19th) with our return in November 1906, when the Roosevelt was standing on end half the time, and the rest of the time was rolling the rail under water, losing two rudders, being smashed by the sea, creeping along the Labrador coast in the berg season, through dense fog, and picking up Point Amour Light only when within a stone's throw of theshore, guided only by the sirens at Point Amour and Bald Head, and the whistles of the big steamships lying at the entrance of the strait, afraid to attempt the passage".

The breeze fell shortly after that, leaving a heavy swell in which the schooner rolled about and lost her steerage way. The fog was as dense as ever and a cold rain added to our general discomfort. About ten p. m. the schooner ran into the middle of a group of large icebergs, which seemed to spring up out of the gloom and rain. In trying to avoid these the schooner missed stays, refused to answer the helm, and came within an ace of drifting bodily on to the largest of the ice-clad terrors. For a few moments it looked as if nothing could save her but, by dint of flattening in the sails and coaxing the rudder she escaped by a few feet. As it was the schooner bumped heavily against a large floating fragment of the berg, which brought the men who were below in their bunks, on deck in a hurry.

This was the third close call since leaving Ponds inlet and the men began to complain that there was a Jonah on board. Some thought that it was the Eskimos skull that Mr Reader had found on the beach near Salmon river and which reposed in the schooner's hold, and wanted to have it overboard in order to propitiate Tornarsuk and avert further evil mischance. After such a continuance of headwinds and narrow shaves we began to wonder if we should ever reach Quebec.

More dangers.—Our troubles, however, were not yet over and we shall all remember for a long time to come the troubles of that night in Belle Isle strait. About midnight the deep notes of a foghorn came suddenly out of the fog, dead astern of the schooner, but we could see nothing owing to the dense fog and driving rain. It sounded again and again and was evidently coming nearer. We answered with our hand fog-horn, and suddenly the bright lights of a large steamer showed high above the fog, a few hundred yards astern and coming straight for us. We gave a succession of snorts and bellows with our foghorn concertina and suddenly the huge black bulk sheered away to port and passing by us was soon swallowed up in the mist. As she turned away she gave three deep toots from her steam fog horn to tell us that she had picked up with her searchlight and would leave us in peace. Shortly after another large steam vessel passed us astern, moving cautiously through the fog and sending out warning blasts from her siren at regular intervals. We heard also, off the starboard bow the plaintive bleat of some fogbound fishing boats, but could see nothing. What with dangerous lee shores on either hand, dense fog, ships groping blindly about all around us and the unseen presence of scores of large icebergs that filled the narrow strait, we had our work cut out on the look-out and at the helm, and passed a trying and anxious night. We were reefing and handling sail all night with the decks. ropes and canvas stiff from the cold rain that beat down through the heavy fog that shrouded everything as a dark pall.

About one a. m. we heard the three, mournful, coughing blasts, that fell away into a long drawn moan, of the steam fog signal at the southern end of the straits and making for it and judging the distance by the sound and the sounding lead, re-adjusted our course. This powerful fog-signal, which pierced the fog and mist at regular intervals, had a most weird and uncanny effect and sounded for all the world like the angry moans of some demoniac monster in pain. If any of our Eskimo friends had been with us they would assuredly have taken it for Tornarsuk himself or some mythical monster that guarded the straits and lived on the bones of shipwrecked mariners.

Another berg.—About 3 a. m. when the schooner was running fast before an easterly breeze and when we were congratulating ourselves that most of the dangers were safety over, an enormous iceberg loomed up, cold, blue and menacing, right in our path. This berg was fully 200 feet high and its summit was wrapped in a dense white cloud. The helm was thrown over and we passed this berg within 200 feet to starboard. The steamer Manchester Commerce recently had her bows stoven in by coming in contact with an iceberg in Belle Isle strait, while outward bound from Montreal, and just managed to limp into St. John's where she was docked and temporarily repaired, but for her comparatively low speed and specially stable build, as a freight boat, she would probably have gone to the bottom with all on board, as she met tempestuous weather after striking the ice island, and had great difficulty in reaching the land. Fortunately, too, she had no passengers on board, and the world thus escaped a possible repetition, on a smaller scale, of the Titanic tragedy of April 1912. We were all glad when the night was over and by day light had passed out of the narrow straits and the fog became lighter.

Clear the straits.—The next day (September 13th) the wind changed to the south-west—a head wind for us—and soon developed into a gale with a very heavy sea running. The schooner lay hove-to, under reefed mizzen and fore-top jib all that day and the next night in the narrow bay at the south-western entrance of the strait, exposed to the pounding of the waves that swept across the whole lenght of the Gulf of St. Lawrence. The schooner rolled, pitched, plunged and strained for about 30 hours under the worst pounding she had yet received. The waves rose like solid walls, 20 feet in height and threatened every minute to swamp our buoyant, but distressed little craft. Men who had navigated the gulf for years said it was the worst and most dangerous sea they had ever experienced. The schooner kept plunging her heavy bowsprit into the solid walls of water and we expected at every dip to see it snap off, and if the bowsprit went we should have lost our topmasts. Two outside planks were stove in by the force of the waves and the stay-bolts in the bow began to draw. The deck planks forward began to open and through the open seams in the deck the water poured down in a fine spray into the dingy forecastle. Half of the crew were sea-sick and the cook was too ill to light the stove; so that our meals consisted of some cold meat and hard-tack. The schooner never had such a biffetting before and strained and groaned like a creature in pain. The water poured through her opening seams and we were kept constantly busy at the pumps. Another 12 hours of such weather would have seen the end of the "Minnie Maud", and of her crew, as no boat could have been launched or could have lived in such a sea.

We were not in favourable position either in regard to the land, as we were right in the funnel-shaped mouth of the strait of Belle Isle, with the rocky coast of Newfoundland on our lee, and the ship was gradually being forced to the eastward under the pounding of the huge seas and by the full sweep of the south-westerly wind.

The discovery of Newfoundland.—About 450 years before Christopher Colombus was born, Newfoundland was discovered by a Norwegian boy named Biorn, son of Hergolf.

In the year 1002, Hergolf, an Iceland colonist, fitted out two small vessels for a trading voyage to the Greenland settlement and placed one of these under the command of his son, Biorn, a youth of 16 years, who, having been bred to the sea almost since infancy, had mastered the details of his profession by the time that he arrived at an age when other boys usually commence their apprenticeship.

When near the southern coast of Greenland, Biorn's ship was driven to the south and west. One morning he discovered a strange land close aboard. Sailing along the coast fot some distance, he found a large bay, into which he steered and dropped anchor. Upon landing the country was seen to be clothed with vegetation and the streams swarmed with fine salmon. Trees of large growth grew in great numbers just back from the shore, and the climate was balmy and delightful. Of natives they saw nothing, and believed the land uninhabited.

Rejoiced over his important discovery, Biorn returned to Iceland, and communicated the news to his friend Lief, son of Eric the Red, who had founded the colony on the coast of that island. The two ambitious young men immediately entered into an agreement to share the expense of equipping a suitable vessel, sailing to this newly discovered land and bringing back whatever cargo promised to reimburse them for fitting out the ship.

Their first sight of new land was not calculated to impress Lief with a promise of its fruitfulness, for it was rocky, barren and gloomy. This gave rise to openly expressed dissatisfaction on his part, but Biorn assured him that further south they would meet with green fields and woodlands. After the fashion of early navigators in naming geographical discoveries according to the features first presented, this place they called Helleland, and to the low, sandy shore which they observed beyond it and which was covered in spots with clumps of small trees, they gave the name of Markland. Two days later they fell in with a new line of coast, and sailing along this for several hours Biorn made out the bay in which he had anchored on his previous voyage. Into this harbour they brought the ship and moored her.

The explorers soon succeeded in catching a number of fine salmon from the river that emptied into the bay, and collected quantities of fruit of different varieties, and of most agreeable flavour. The temperature of the air, as on the former voyage, was found to be delightfully mild to the Icelanders, and the soil proved to be rich and productive. One of the members of the crew, a German, met with quantities of grapes growing wild, and from this circumstance the two young navigators decided to name the country Vinland, meaning the land of grapes. This Vinland of the early voyagers is known at the present day as Newfoundland. After making several short cruises to the southward and westward, and sailing through the Gulf of St. Lawrence until the river of that name was reached, the ship returned to her first anchorage, where the explorers passed the winter.

During the months that the vessels lay at anchor, many valuable furs and skins were obtained by the hunters, and in the spring the ship was freighted with valuable lumber hewn from the forests that grew close to the shore. With the proceeds of this venture the two boy discoverers fitted out their vessel the second time, but an unfortunate quarrel breaking out between them, Lief sailed alone to established a colony after the example of his father. For this purpose he embarked some 70 men and women, who were glad to exchange the bleak shores of Iceland for the rich meadows and purling streams of this promised land.

Perils of Newfoundland Sealers.—The following editorial on the subject of the perils of the Newfoundland sealers appeared in the "Quebec Chronicle" of April 13th, 1914: "There is no more thrilling chapter in the story of the harvest of the sea than that which tells of the excitement, the perils and the profits of the great spring seal hunt among the ice-floes of the Gulf. The annual value of the industry runs from half a million to a million dollars per annum, and its importance to the Newfoundlanders may be judged of from the fact that some six thousand men, 22 large steamers, and a number of sailing vessels take part in the seal-hunt. To this must be added a considerable number of men who are employed in the manufacture of the oil and its preparation for market.

It must be remenbered that the seals captured in the Gulf and around the coasts of Newfoundland are very different from the seals of Alaska, whose soft coat is the pride of the city belle, being the hair seals, which furnish the seal oil of commerce. The color of their skin is mottled grey, and though some winter garnments have been made of it, and it has lately given promise of becoming fashionable for overcoats, capes and caps, it is chiefly used for the manufacture of a coarse-grained but expensive leather, employed in the making of trunks, boots, purses, etc., and also in costly book-binding.

There are four species of seals in the waters around Newfoundland and Labrador, that known as the harp seal being par excellence the seal of commerce. It owes its name to a broad, curved line of connected dark spots proceeding from each shoulder and meeting on the back above the tail, forming a figure something like an ancient harp. There is a still larger variety known as the hood seal. The male, called by the hunters the dog-hood, is distinguished from the female by a singular hood or bag of flesh on his nose. When attacked or enraged, he inflates this hood so as to cover the face and eyes, and it is strong enough to resist seal shot. When thus protected, he can only be killed by being shot in the neck or at the base of the skull. He fights desparately in defence of his mate and young ones, and, if they are killed, he becomes furious, inflates his hood, while his nostrils dilate into two huge bladders. His appearance is now terrific, and with uncount, floundering leaps he rushes on his foe. Instances have occured where a fight between an old dog-hood and five or six men has lasted for an hour; and sometimes a hunter is fearfully torn, and even killed in the encounter. The young of the seal are born on the ice-fields off the north-east coast of Newfoundland about the middle of February. They are suckled by their mothers for about six weeks, and about the first of April they take to the water. Having reached the Straits of Belle Isle the vast herds of seals floating in a southerly direction with the Arctic current, divide into two distinct parties, one passing through the Straits into the Gulf of St. Lawrence, and the other moving along the eastern shore of the island. Early in May, accompanied by their young, they commence their northerly movement, and the sealing season of the Gulf is over.

The sealers usually leave St. John's shortly after the 10th of March, and it may be weeks or even months before they return, all depending upon the ice. On the other hand, the steamer Neptune, after an absence of only eighteen days, returned to port some few years ago, loaded down to the water's edge with 42,000 seals valued at $105,000. The object of the sealing vessels is to get as near as possible to a large field of ice containing seals. The men are landed from small boats on to the ice-field, sometimes several miles in extent. Then the butchery of the annimal commences. Each man is armed with a stout stick, eight or ten feet long, which not only aids him in leaping from one ice-floe to another when necessary but also serves him as a weapon for killing the seals. One blow over the nose suffices to kill or at least to stun a seal, and as many as possible are so disposed of in order to prevent their escape, before the final slaughter is commenced. The great aim of the hunters is to get among the "whitecoats" as the young harp seals are called in their baby-hood, when yet fed by their mother's milk and while they are powerless to escape. The oil extracted from the blubber of these young seals is of a much finer quality than that obtained from adults.

Considering all the perils encountered, it is surprising that fatal disasters are not more frequent, and that so many vessels year after year come home unharmed. Only men of iron can successfully face and endure such dangers. They are so accustomed to the sea and the ice-floes that they seem to have an absolute contempt for their terrors. They leap fearlessly from pan to pan and think little of passing a night on the ice far from the steamer going off as far as four or five miles in their eagerness to slay. Should a fog or snowstorm set in, there is risk of losing their way and perishing miserably in these ice-deserts, as has been so fearfully illustrated during the last few days.

Perils of Newfoundland Sailors.—The most terrible catastrophe in the history of Newfoundland occured on March 31, 1914, when the sailing fleet consisting of the Steamers "Newfoundland", "Bellaventure", "Florizel", and "Bonaventure" were suddenly, without warning, overtaken by a terrible blizzard of snow, sleet, hail and rain when engaged in hunting seal on the ice-floes off Newfoundland banks. When the easterly gale descended about a thousand men were scattered over the ice several miles away from their vessels. The method of seal-hunting pursued by the Newfoundland ships in for four-fifths of the crew to leave the ship every morning and travel over the ice a distance from four to six miles killing seals as they go and heaping them in piles for the ship to secure as she follows them. The men go lightly clad, and with but little food, and when blizzards overtake them their chances of escape are few. When the storm burst the men nearest the ship got on board as quickly as they could but many were unable to find their way through the blinding snow-squalls. The "Newfoundland" was separated from the rest of her crew by the storm and they were exposed on the grinding and crushing floes to the full fury of the blizzard, for fully 48 hours before the storm abated and enabled the "Bellaventure" to go to their rescue. So bad was the condition of the ice that it took that ship nine hours to penetrate four miles through the floes to where the unfortunate men, or such of them as had survived, were imprisoned. They found the greater number of the survivors unconscious, many were dead, while others had been completely blinded by the frosty snow or rendered delirious from cold, hunger and exposure. Several bodies were so encrusted in the ice that they had to be chopped out with axes. As a result some eighty men were frozen to death and many were rendered blind or badly frostbitten.

In the same storm another fine vessel the Southern Cross which had previously been used by Sir Ernest Shackleton on a South Polar Expedition, disappeared amid the vast expanse of ice-floes off Cape Race with a crew of 170 men on board, when returning from successful catch of 17,000 seals in the Gulf of St. Lawrence. No signs of her were reported after prolonged search and it is supposed that this staunch vessel, specially built at Quebec for work among the heavy ice, had been wrecked with all on board. Thus in one day 250 families were reduced to destitution by the loss of their bread-winners. In 1898 a similar disaster overtook the steamer Greenland when out of a crew of 180 men who had been sent out on the ice-floes, 48 were frozen to death and 63 were frostbitten. The year 1908 and 1909 were also disastrous, as five ships were lost in those two seasons.

Head winds.—A bright moon shone out that night and the fog lifted and the wind and sea, although still very heavy, began to abate. On september 14th, the schooner continued to plunge and roll about in the heavy sea and we kept constantly at the pumps. We were all convinced at this time that there was not only one Jonah on board, but several. On September 15th, we were still battling against a heavy head sea and a strong wind from the south-west, but we stood in towards the north coast and saw several steamers pass, outward bound. The day was fine with a bright sun shining on a deep-blue sea and sky. At 3 p. m. we had passed the fine new lighthouse at Ste. Mary's Isle and in the evening the wind veered to north of west, and the schooner plunged her nose into a very heavy sea all night. The next day (September 16th) the wind was still ahead, west by south, and the vessel kept pinching into the wind, making about two knots an hour in the right direction. The day was fine but we were all heartily tired of the constant head winds and sighed for a favourable breeze. We spent the night tacking about between the north shore of Anticosti and Natashkwan. The breeze fell at midnight and the schooner rolled in the heavy swell under the rays of a brilliant moon. September 17th was a beautiful day and the sun's rays were very warm; a light breeze blew from the south-west, causing us to make slow progress. In the afternoon the breeze veered all round the compass at times developing into a 7-knot breeze and at others dropping into a dead calm. In the night it rained heavily.

Perroquet Light.—On September 18th. we were off Anticosti in a smooth sea with fog, rain and a head wind. All hands were tired of the slow progress and not in the best of humours. At noon the weather cleared and the wind changing to N. N. W. we bowled along until we reached Perroquet lighthouse, when the breeze dropped and we lay becalmed all night. There was a most beautiful sunset and the sky was a clear, carmine-pink as the pale golden sun sank slowly into the dark-blue sea. Then the light of the Perroquet lighthouse shone out and twinkled across the calm water and then another from the Light at the west end of Anticosti. The brilliant evening star slowly rose in the pale, azure sky and later a gorgeous moon rose out of the sea and flooded the scene with its golden radiance. The schooner rose and fell lazily on the calm, moonlit sea. It was a perfect night.

Beautiful weather.—September 19th.—A beautiful day with bright, warm sun and cloudless sky and we lay becalmed off the barren, un-inhabited coast of the north shore, which consisted of high rocky cliffs covered with stunted timber, west of the Moisie river. We passed another calm, beautiful night under the brilliant moon and starlit heavens; and the schooner rolled heavily on the swell from the south-west The long-rolling swell became so heavy that we were obliged to lower the mainsail and lash the long boom amidships, so great was the strain on the mast. The deck was covered with dew and the next morning (September 20th) we enjoyed a most beautiful sunrise, as the sun rose in its golden splendour above the eastern horizon in a sky that was golden-pink. The sun shone bright and warm over the blue sparkling waters of the gulf. In the distance we sighted the white sails of three schooners and passing by the long, straggling fishing village of Moisie at noon, reached the Seven islands' lighthouse at 5 p. m. In the afternoon a fine breeze sprang up from the north-east, the first fair wind that we had enjoyed for nine days, and we ran before it all night, making the Egg island lighthouse at three o'clock the next morning. The night was perfect after a gorgeous sunset; when a brilliant moon shone high in the clear starry sky in which were conspicuous the two Dippers, the Pole Star, the Evening and Morning Star and that most beautiful constellation of all, Orion's belt.

We were now at the apex of the Equinox and the sun rose at 6 a. m. and set at 6 p.m. being visible for exactly twelve hours during the day; while the silvery moon, just past the full, rose at 7 p. m. and remained visible until sunrise. Porpoises and blackfish sported and gambolled round the schooner, and the weather was ideal.

The Stars.—Over a hundred constellations, or star-groups, are known to man. The naked eye, on a clear night, can distinguish six thousand stars-eighty million can be seen through a powerful telescope and, when the moon passes between us and certain nebulous spaces, she hides over fifty thousand stars from our view.

Constellations.—The principal constellations in the Northern Hemisphere are the Little Bear (Little Dipper) of which the Pole Star forms part; the Great Bear (Big Dipper) or David's Chariot; Cassiopeia, opposite the Great Bear; Cygnus (the Swan) or the Cross, in the Milky Way; the Coachman; Lyra and the Eagle, to the south of Cygnus; Andromeda, Perseus and Pegasus to the south of Cassiopeia; Hercules and Bootes (the Ox-Driver) including Arcturus, the second largest star; Taurus (the Bull) whose eye is Aldebaran; Germini (the Twins) and Leo (the Lion) including Regulus to the south of Capricornus (the Goat) and the Great Bear. The Equator is marked by the Spica of Virgo (the maiden), and by the Three Kings which form part of Orion, the most beautiful constellation in the heavens.

In the Southern Hemisphere we find Canis Major, of which Sirius (the Dog Star) the greatest and most brilliant of all stars, forms part; and the far-famed Southern Cross.

All these stars are, in reality, brilliant suns many times greater than our own, but which appear to us on account of their great distance as only fixed twinkling points of light. They probably all have their individual and, to us, invisible planets. The nearest star is 290,000 times further from us than the sun.

The Pole Star—The Pole Star is 2,900,000 times further away than the sun, and its light takes forty-six years to reach the earth, while the Sun's light reaches us in 8 m. 16s. The Sun and the Pole Star are considered by astronomers to occupy the same point in the heavens and the axis of the Earth, i. e. the imaginary line drawn between the Poles and prolonged indefinitely, passes through the centre of both. The North Pole is situated 1½° from the Pole Star.

The Sun.—The Sun is 1,300,000 times greater than the Earth and 93,000,000 miles away. It is constantly moving through space towards Hercules. The sun's diameter is 886,400 miles and it takes 25 days, 10 hours to revolve on its axis.

The sun is composed of a more or less fluid nucleus which is relatively obscure, and an exterior gaseous envelope or incandescent photosphere, whence emanate our light and heat. The rotation of the sun was discovered from observation of the sun spots on the nucleus or main incandescent body. Spectral analysis has demonstrated that the photosphere contains sodium, iron, nickel, copper etc., in a vaporised state, and that the gaseous protuberances are composed of incandescent hydrogen.

The Moon.—The Moon, our only visible satellite, is a solid globe, devoid of water or atmosphere, one forty-ninth the size of the Earth, and 240,000 miles distant. The surface of the moon is covered with high mountains and vast craters of extinct volcanoes. The diameter of the moon is 3,447 kilometres or about 2400 miles. The moon circles round the earth in an orbit that is elliptical rather than circular, and at times the Moon is some 30,000 miles nearer the Earth than at others. The moon completes her circuit round the earth in 27 days, 7 hours, 43 minutes, 11 seconds and five tenths, but as the Earth has travelled a considerable distance along its own orbit round the sun in that time, the Moon does not reach opposite the same spot on the Earth's surface until two days later, that is 29 days, 12 hours, 44 minutes, 2 seconds and 87/100 ths. The Moon also spins round its own axis in the same time as it takes to revolve round the Earth, and as its axial movement is in the contrary direction to its course round the Earth, we only see one and always the same side of its surface; the other side is eternally unknown to us. The rate of movement on its axis is 4 metres 86 centimetres per second at the surface and it travels with the Earth round the sun at a rate of 90,000 kilometres or approximately 60,000 miles an hour. It travels at a rate of 1197 metres or 800 miles per second round the Earth and crosses the orbit of the earth round the Sun, in sinuous fashion, 24 times in the year.

The St. Lawrence.—The river St. Lawrence is becoming of greater importance to the development of the maritime commerce of Canada every year, and many millions of dollars have been spent by the Canadian Government in widening and deepening the channel between Quebec and Montreal. The St. Lawrence and Ottawa rivers are to Canada what the Hudson River and Erie Canal are to the United States. Montreal and Quebec share the ambition of becoming the main gateway of Canada, as New York at the mouth of the Hudson has become the Metropolis, and main port of entry and departure and the distributing centre of the United States.

Navigation is closed on the St. Lawrence from the end of November until the middle of April, a period of four and a half months in the year, when the fruit boats, laden with oranges and bananas from the West Indies, and the coal-boats begin to arrive. In April the regular freighters begin to run to Quebec, although the channels are still filled with ice-pans and dense fogs are common. In May and June the great passenger liners and mailboats can travel from Quebec to Montreal and these are the two best months for navigation in the year. In July the weather is warm and the gulf clear of ice; but it is often obscured by the dense smoke arising from numerous and extensive forest fires that often rage along both shores and render navigation difficult and dangerous on account of the narrow channel, cross-currents, shoals and rocky islands of the riverbed. In August and September the navigation is rendered unpleasant by the frequent strong easterly winds accompanied by heavy rains and dense fog when the wind veers to the west; icebergs then begin to drift through Belle Isle straight into the gulf and add to the dangers. The easterly winds will sometimes continue to blow uninterruptedly for two and three weeks at a time. In October the wind is very variable and liable to blow from any quarter. In November the weather is very cold but clear, and navigation is at its safest; as the weather is usually free from fog and rain and there are few if any icebergs in the gulf. A westerly current sweeps in through Belle Isle strait along the north coast as far as Pointe des Monts, where the gulf and river meet; and an easterly current sweeps down along the south shore to the Atlantic ocean. Large ships and ocean steamers always pass to the south of the large island of Anticosti; the northern channel being only used by fishing boats and small local trading steamers and schooners. Although the various channels, shoals and rocky islets are well buoyed and lighted every ocean-going vessel is obliged to take a pilot for the river as far as Quebec and another pilot for the section between Quebec and Montreal; and no man can be a pilot on the St. Lawrence until he has served a seven-years apprenticeship on steamers navigating the river and gulf and made a certain number of voyages across the Atlantic on an ocean liner, and after that have passed a rigorous examination.

Winter Navigation.—The question of opening the St. Lawrence river to navigation by means of giant ice-breakers during the winter months has occupied the attention of the Canadian Government for many years as a result more especially of the presure brought to bear by the shipping and commercial interests of Montreal; and the Government at Ottawa has just placed an order in England for the construction of the most powerful ice-breaking ship in the world, to cost $500,000.00. The following letter written by Mr E. T. Nesbitt, of Quebec, which appeared in the "Quebec Chronicle" of 17th. March 1914, gives a careful and lucid summary of the difficulties which beset the opening of the St. Lawrence to winter navigation:—

"Winter navigation and the question of keeping the St. Lawrence open during the winter by powerful ice-breakers are questions that are as broad as the St. Lawrence itself. There are four distinct conditions to be considered in as many different localities, such as the "180 miles of ice" in the Atlantic, the movement of ice in the gulf, and the conditions in the river from the gulf to Quebec and again from Quebec to Montreal. These are so totally different that they require long experience to discuss. In fact, it is hard to find any one man capable of grasping the whole situation, so varied are the conditions; what would be a good course to pursue in overcoming the difficulty at one stage would be the very cause of making it more difficult at the other.

In considering the problem of keeping the channel open between Quebec and Montreal (if it is possible), we must remenber that ice is continually forming on that 170 miles of river and floating down towards the gulf for four and a half months, with the current practically continuous in that direction. The river must of necessity be covered with floating ice, freshwater ice, hard as flint and growing in area and thickness every moment. These ice-fields eventually completely cover the lower river and greater part of the gulf. When, under the influence of the sun and warm water from the west in spring, ice ceases to form in the upper river and the ice-breaker's mission is accomplished, we would find that, although the river is clear. this very clearing has covered the gulf to such an extent as to retard the entrance of ships into it; therefore, the very object which the breakers have to accomplish has been defeated.

A Suggested Remedy.—On the other hand, if the ice were to form early, by allowing the bridge to gather at Cap Rouge, the narrowest point of the St. Lawrence, immediately above the port of Quebec, thereby assuring the formation of an icebridge over the whole of the river from that point to Montreal, there would be so much less ice floating towards the gulf. What would be the result? Assuming that the ice forming from Quebec to Montreal were half a mile wide-85 square miles of ice-passing out to the gulf, say one half of it every tide at two tides per 24 hours, for 120 days would cause 10,200 square miles of the surface of the gulf to be covered by spring. This vast area of ice would be added to by natural increase and by the ice of the lower St. Lawrence from Quebec.

To overcome this, I would advocate that not only should the ice be allowed to form in the river above Quebec, but that a study should be made of the possibility of helping it to form as soon as the last ship has passed out in the fall. As the channel at Cap Rouge is very narrow, piers could be built or contrivances could be devised, so that when the ice ceased forming in spring, about March 25th, the powerful ice-breakers, would accomplish in from ten days to two weeks what, under the other conditions, would take them four and a half months.

I advance the theory that, allowing or helping the ice to form on the river above Quebec as early as possible, would avoid the terrible ice jams that occur at Cap Rouge; because when an easterly gale occurs the ice is held back at this narrow point, and the great weight of that behind chokes the gorge. The fragments work their way underneath until they form a solid wall or barrier to the bottom which can be removed only by melting. Should such a gale occur when the ice-breakers were west of Cap Rouge they could not get through. Guncotton could not break this barrier when it was tried by the garnison at Quebec on several occasions without success; the ice-breakers would be at the mercy of the ice with only one result.

Result of Early Formation.—The ice by being allowed to form as early as possible, would create a sheet all the way to Montreal, and it is well known that ice so forming hardly ever gets thicker than thirty inches. Consequently the great jam at Cap Rouge, which has always been the reason for the lateness of the opening of the river in the spring would be avoided. In support of my theory, it is worthy of notice that, when the ice bridge has not formed above Quebec, the river from Quebec downwards is completely covered with a thin sheet of ice all winter.

By following the reports from signal stations along the river as to movements of ice a difference is noted as soon as the Cap Rouge bridge has formed.

Winter Navigation.—As to the feasibility of the navigation of the St. Lawrence during winter, there can be no question in anybody's mind about its impossibility above Quebec. What use would it be to keep that part of the river open if the gulf would be so choked with ice by this very effort that ships could not enter.

The opening of the river earlier in the spring can be accomplished, and winter navigation from Quebec to the sea can be benefitted, by holding back the heavy floating ice that forms above Quebec and covers the river eastward from that point.

Quebec to Tadousac.—Let us now consider the problem of ice-breaking from Quebec to Tadousac or Red Island. This part of the river would be considerably improved by the ice forming above Quebec being held back. A ship would only have to contend with the newly formed aheet ice moving out every tide, which would not have time to get thick enough to impede materially the progress of a steamer.

How about snowfall and snowdrift and the short days of December and January? The steamers that have already got down and up the river below Quebec in winter have always left Quebec at break of day after waiting day after day for a promising time to leave in order to get below the St. Roch Traverse and, if possible, below Red Island, by daylight.

If unfortunately, a snowstorm or drifting snow off the floating ice were to spring up and a navigator were not able to keep his landmarks in sight in that part of the river it would be fatal; to anchor is out of the question-no anchor, chain or ship, has yet been devised that could withstand the strain of the ice moving with the wind and tide.

All I have said in the foregoing remarks goes to show that a ship's chances are very much improved when the Quebec-Montreal end of the river is frozen over.

To Cape Ray.—Now for the gulf as far as Cape Ray or Cabot Strait between Cape Ray and Cape Breton.

My experience has been that navigation of the gulf is perfectly free and open until about the tenth of January; after that date floating ice-fields appear and increase in size with the advance of the winter; near spring the gulf reaches its worst condition, and the rivers in the west disgorge ice, which comes down, impelled by the influence of the sun and warm water, and forms the great ice fields. These are blown about by the winds and fill the gulf from Anticosti to Cape Breton Island. If northeasterly winds prevail very long at that season, the ice is retarded from making its way to the ocean through that comparatively narrow strait between Cape Ray and Cape Breton, so that when our river is clear the entrance to the gulf is jammed. The reverse conditions obtain in the fall, so that navigation is open in the gulf six weeks later than the river; while navigation could be opened in the river three or four weeks earlier in the spring than in the gulf.

The fourth consideration is the entrance to the gulf.

Some years ago a steamer was put on between Paspebiac and London to run in winter. The late J. U. Gregory, Agent of Marine and Fisheries, Department in Quebec-than whom no man knew more about ice conditions in the gulf-asked me if I thought she would succeed. My answer was that she would get out of the gulf easily on her December trip and on her January trip if she would steer north on leaving Paspebiac and hug Anticosti coast and steer that course to Cape Ray, but I was sure she would not get back on her return trip in February. The ship steered a straight course out across the gulf and she wintered in the ice. A Government steamer from Pictou had to go to her assistance with provisions, and she drifted for months at the mercy of the ice.

I hope that the reading of this article, will start a movement to investigate ice conditions in the St. Lawrence by competent men

I am sure a steamer could run between Murray Bay and the lower north shore ports all winter, provided no importance would be attached to the fact that schedule time would be kept up. Although the north shore is comparatively clear during winter, the prevailing winds being west to north, yet the occasional easterly gales do block up that shore for several days at a time, during which navigation is impossible.

The navigator should have a free hand in being allowed to go and come as conditions permitted; after early March conditions would improve quickly. Ice conditions in the lower river are greatly controlled by the current as well as the wind, and, as the prevailing winds are mostly northerly, and as the current is outwards, the tendency is toward the south shore. Thus the current sets from the Pointe des Monts over towards the Gaspe coast about Cape Chat; therefore the north shore is never so congested with ice as the south shore, and a vessel has a better chance to go up and down that part of the river in winter by keeping to that coast.

Opening of Navigation.—For a period of 64 years, from 1850 to 1913, the St. Lawrence was opened to navigation between March 20th, the earliest recorded date, and May 5th the latest recorded date. The average date of opening was round April 20th. The earliest date of opening recorded was on March 20th, 1878 and the latest date, May 5th, 1885.

Closing of Navigation.—For the same period navigation was closed between November 26th., the earliest recorded date, and January 2nd., the latest. The average date of closing of navigation on the St. Lawrence was round December 12th. The earliest date of closing recorded was November 26th, 1873 and the latest January 2, 1878 and 1882.

Open Season.—Thus the average number of days in the year that the St. Lawrence was open to navigation was 237 days, or about eight months.

Navigation.—An authority on ice-navigation in the St. Lawrence once stated it as his opinion that most of the disasters to shipping would have been prevented if two precautions had been taken. One of these was the more frequent use of the lead in foggy weather and narrow channels; and the other was a dead stop, or at least the smallest possible speed with any headway on at all, in the presence of ice, or even in possible proximity to it whenever the weather was not perfectly clear.

Since writing the above paragraph the dreadful accident to the "Empress of Ireland" has occured in a sudden descent of fog off Father Point the vessel being rammed by the collier "Storstad" shortly after dropping her pilot at that place. The Empress sank in five minutes and eleven hundred persons lost their lives. Had both vessels stopped their engines the moment the fog descended the desaster would not have occured.

Pointe des Monts.—By daylight (September 21st) the northerly breeze stiffened and we bowled along at a steady five-knot clip. We passed the Egg Island light at 6 a. m,; the Caribou River Fishing village at 8 a. m. where the local magnate, Mr de Jourdain, hoisted a flag and saluted us with three cannon shots of welcome, which we acknowledged by dipping our ensing. Our spirits rose at the sight of human habitations and we began to feel as if the end of our tedious journey was approaching. Right ahead of us, gleaming white, solitary and majestic, rose the massive lighthouse of Pointe des Monts, the sentinel at the gate of the mighty St. Lawrence. It was our last place of call before we sailed north fourteen long months before. We ran towards this welcome landmark at 7½ knots an hour before an ever ripening northerly breeze, and, when abreast of it, hove-to and sent the mate ashore in the punt for letters and newspapers and to telegraph the fact of our arrival to Quebec. The lighthouse keeper treated us to a three-gun salute which we ackoowledgeby dipping the red ensing that was flying at our main. The sea became very rough and the breeze grew very strong while we waited for our messenger to return. He had some trouble in getting back to the schooner in the cranky punt and nearly upset as we threw him a line. But he brought us from the lighthouse a bundle of newspaper, the first we had seen for fourteen months and we were soon immersed in the news of the world, We squared away at 11 a. m. and ran from eight to ten knots before a strong east wind and heavy following sea. From noon until four o'clock that afternoon we made 39 knots, when the fog came up and we had to take in the mainsail, gaff-topsail, staysail and jibtop-sail.

From then on we alternately beat our way against head winds, calm, fog and rain, up the river St. Lawrence; anchoring at every change of the tide, and were kept constantly busy reefing, lowering and hoisting sails, tacking, boisting and letting go the anchor.

When anchored one night right in the fairway we were nearly run down by a large steamer that rushed past us out of the fog. We anchored again near the Horse-shœ shoal, in the St. Rock traverse, as our flying-jib stay had snapped in two and had to be repaired.

We cast anchor opposite the bright little town of L'Islet, where the church-bells rang out and the flag at the end of the wharf dipped us a welcome. Caron rowed ashore and brought us back some more newspapers.

The southern coast of the St. Lawrence made a pretty picture in the warm sunlight, with its church spires, trim hamlets, well-cultivated farms and its hills of green, gold and russet, covered with wide-spread groves of maple and birch, the leaves of which were beginning to turn to rich hues of crimson, brown and gold.

On the morning of the 24th, we passed under the impulsion of the strong, inflowing tide, the famous old Canadian ship "Arctic" the strongest-built ice-ship in the world and now converted into a lightship at the St. Roch Traverse, where she rests, after her many eventful voyages to the Frozen North, on the stormy bosom of the St. Lawrence, a guide and a beacon to the commercial shipping that throngs that historic stream.

We anchored the last night off the beautiful Ile d'Orleans with its trim painted villas, farmhouses, and fertile fields; and the hoot of passing tug, rattle of machinery and the noise made by locomotives on the opposite shore sounded strange to our ears that had so long been accustomed to the silent stillness of the north. Coming back to civilization, after living among the Eskimos in peace and quiet, the world seemed full of discord, wars, strikes, murders, robberies and disasters; unceasing trouble and turmoil seemed to be the principale theme of the newspapers. Here money and the Almighty Dollar governed everything and everybody, and reigned supreme. Up there in the north, money was unknown and life was reduced to the simplest problems; while here money was every-thing and peace and friendship were supplanted by greed, cunning, and seemingly perpetual strife and injustice. The contrast was most forcible and made us doubtful of the benefits of this so-called Christian civilization; we were not at all sure when the voyage was so nearly ended that we looked forward to the change. The costs of living, too, seemed to have gone up by leaps and bounds during our absence.

Reach Quebec.—At two o'clock in the afternoon of September 25th, we came abreast of the bustling terminus of Levis and had a magnificient view of the famous Montmorency Falls that fell and tumbled in a foaming torrent over the rocky cliffs. In front of us lay the historic town and fortress of old Quebec, the city founded by Champlain in 1608 and which has formed the cradle of the great French-Canadian race. Puffing tugs swarmed around us and the whole scene was one of restless occupation and activity. The day was a beautiful one and the sun shone down with such warmth that we were nearly roasted in our sealskin clothing.

A tug took us peremptorily in tow and we were soon moored inside the cement walls of the Bassin Louise, where a small crowd of friends and curious onlookers welcomed us back to civilization.

The trip was over and all that remained was to quarrel over the spoils and settle down once more in the hum-drum channels of every-day life.

We can not do better than wind up the chapter with the words of Commander Robert E. Peary, "The lure of the North. The "Arctic fever" as it has been called, is a strange and powerful thing. More than once I have come back from the great frozen spaces, battered and worn and baffled, sometimes maimed, telling myself that I had made my last journey thither, eager for the society of my kind, the comforts of civilization and the peace and serenity of home But somehow, it was never many months before the old restless feeling came over me. Civilization began to lose its zest for me. I began to long for the great white desolation, the battles with the ice and the gales, the long, long Arctic night, the long, long Arctic day, the handful of odd but faithful Eskimos who had been my friends for years, the silence and vastness of the great white lonely North."

CHAPTER XIII

HISTORY OF HUDSON BAY

Frobisher.—Previous to the discovery of Hudson Bay by Henry Hudson, in 1610, several earlier navigators had entered Hudson Strait, Sir Martin Frobisher in 1578, when making a voyage in search of gold on Hall island at the entrance to Frobisher Gulf was carried southward by strong currents and sailed for some distance through the strait.. If Frobisher had been on a voyage of discovery he might easily have entered Hudson Bay, but discovering his mistake, turned back and entered Frobisher Bay. Two years before, en 1576, Frobisher filled with enthusiasm by accounts of a mythical strait of Anian, which was said to offer a safe passage between the Atlantic and Pacific, through the north temporate regions of America, resolved to explore the strait. Aided by powerful friends, he overcame the opposition of the Muscovy Company and under the direct patronage of Queen Elizabeth, he succeeded in outfitting three small clumsy vessels, two being of 25 tons burden each, and the third being a pinnace of 10 tons. These he provisioned for 12 months, and with the combined crews, numbering 35 persons, sailed from the Thames. On the 11th of July, in North Lat, 61°, high pinnacled land, covered with snow was seen. Off this and the pinnace foundered with all on board, and his other consort, deserting, returned to England.

Continuing to the westward alone, in a leaky ship with a sprung mast, high land was again seen on the 28th of July. Frobisher named this land Queen Elisabeth Foreland, but it was not until the 10th of August that a landing was affected. The following day, in north Lat. 63°, he entered the bay which bears his name, thus being the first to reach the great island of Baffin, which has an area of 211,000 miles square and is the largest and probably the most valuable of the Arctic islands.

Davis.—In 1585, John Davis, "a man well grounded in the art of navigation" was placed in command of two vessels, the Sunshine and the Moonshine, by some London merchants, with the object of searching for a north-west passage. His combined crews numbered 42 persons. On his outward voyage Davis landed on the southeast coast of Greenland, and named that coast the Land of Desolation. One fiord in Lat. 63° 15'N., where the Danish mission stations of Godhaab and Nye Hernhut are located, he named Gilbert's Sound. He then proceeded to Exeter Sound in Baffin Land, which he reached five days later and where he anchored on August 5th, 1585. He named Cape Dier and Cape Walsingham. Davis then sailed south and up Cumberland Gulf for sixty leagues. He afterwards sailed south till he reached Cape Chidley, at the southern entrance to Hudson Strait, which he also named. Davis remarks on the strong tides that he met with in the entrance to Hudson Strait.

Weymouth.—George Weymouth was the next adventurer to seek the north-west passage. He was fitted out by the Muscovy Company of London in 1602. On the 28th of June, 1602, in the Discovery, Weymouth reached Warwick's island, between Frobisher and Cumberland bays, and sailing northward passed Cape Walsingham and nearly reached the 68th parallel, when the crew mutinied and forced him to return south. Passing around Hatton headland on Resolution island, he, too, sailed a considerable distance up Hudson Strait, and then returned to England, where he arrived on the fifth of August.

Knight.—Captain John Knight, in the Hopewell, sailed in 1606 but the voyage terminated speedily by the death of Knight, his mate and three of the crew, who were surprised and slain by the Eskimos.

Hudson.—In 1610 Sir John Wolstenholme and Sir Dudley Digges fitted out the Discovery, of 55 tons, to continue the search for a northwest passage, and appointed Henry Hudson to the command, Hudson had already proved his capacity as a bold and successful navigator on previous voyages to Spitzbergen and to the Hudson River on whose banks now stands the stately and bustling metropolis of the United States. This was the last voyage of Henry Hudson and it resulted in the discovery of Canada's great inland sea, which was named after him. Eleven days after sighting the south shores of Greenland he entered Frobisher Bay, but was soon turned back by ice and then passed south into Hudson Strait, which he followed westward into Ungava Bay, where he was greatly obstructed by ice. Passing Akpatok island, which he named Desire Provoketh, on the 11th of July, he reached the islands of God's Mercies, and then sailed along the south shore of the strait; naming it Magna Britannia. He sailed into Hudson Bay on the 2nd of August, through a strait about two leagues broad. The southern head of this strait was named Cape Wolstenholme and the northern one called Saliburies Foreland (Salibury island) Hudson's journal ends the next day, August the 3rd and the rest of the sad story is told by Abacuk Prioket, who states that they were frozen in on the 10th of November, in the southeast part of the bay, after sailing three months through a labyrinth of islands. Dissentions had early sprung up among the crew, and in the month of June following a mutiny broke out headed by Robert Juet and Henry Greene. On the 21st. Hudson was seized by the conspirators, and, with his young son, forced into a small boat. The carpenter John King, whose devotion is worthy of mention, accompanied him voluntarily, while six sick men were also forced into the boat, which was cut a drift, never to be heard of again. On the way home Juet and others of the leading mutiners were killed by the Eskimos at Cape Digges, and the remainder only reached England after great sufferings from famine and other hardships.

Button.—Roes Welcome was first visited by Sir Thos. Button in July 1613. In 1612 Button accompanied by Bylot and Pricket of Henry Hudson's mutinous crew entered Hudson Strait through the channel between Cape Chidley and the Button Islands. Having passed Hudson Strait through the channel, he continued westward, passing the south end of Coat's island, which he named Cary's Swan's Nest, and reached the western side of the bay, north of Chesterfield inlet, where he named the land "Hopes Checked" because further progress to the west was barred. He wintered at the mouth of the Nelson River. His crew suffered greatly from scurvy, but an abundant supply of birds and fish in the spring recruited the strenght of the men sufficiently to allow them to continue the voyage. This is memorable as the first instance of a crew wintering in the north and being sufficiently healthy to remain the following summer. The year's voyage ended in latitude 65°N. near Whale Point in Roe's Welcome.

The following extract from Prince Henry's instructions to Button, dated 5th of April 1612, shows the accurate knowledge of Hudson Strait possessed at that early date: "being in; we holde it best for you to keep the northern side, as most free from the pester of ice, at least until you be passed Cape Henry, as from thence follow the leading ice, between Cape James and Queen Anne's Foreland, the distance of which two capes observe if you can, and what harbour or rode is near them, but yet make all the haste you maie to Salisbury island, between which and the northern continent you are like to meet a great hollowe billowe from an opening and flowing sea from thence."

Baffin.—In 1615 William Baffin, accompanied by Bylot, sailed through Hudson Strait. He then passed north of Mill island into what was subsequently termed Fox Channel and traced the northeast shore of Southampton island, from Sea-horse point to Cape Comfort, the last being according to his observations in latitude 65° N, Long. 85° 22'W. Doubling this cape, the tide was found to set differently, from what had been expected, and gave no hope of a passage in that direction, so he turned back. The following extract from Baffin's journal gives his opinion as to the possibility of a passage westward being found leading from any of the channels entering Hudson Bay. "And now it may be that some expect that I should give my opinion concerning the passadge. To those my answere must be, that doubtless there is a passadge. But within this strayte, whome is called Hudson's Straytes, I am doubtful supposing the contrarye. But whether there be or no, I will not affirme. But this I will affirme, that we had not been in any tyde than that from Resolutyon Island, and the greatest indraft of that cometh from Davis' Straytes; and my judgment is, if any passage within Resolution Island, it is but some creeke or inlett, but the maine (passadge) will be up fretum Davis." In accordance with this opinion in 1616, Baffin sailed up Davis Strait, his instructions being to reach if possible the 80th parallel before turning west-ward. By following along the Greenland coast, and after being beset and greatly embarrassed by the ice at several places, he succeeded in reaching parallel 78° N, from where he saw, in the offing, Smith Sound, which he named after Sir Thomas Smith. This was the northern limit of the voyage, and Baffin, after circum-navigating Baffin Bay, returned home.

Jens Muck.—About this time, a Danish expedition, under the command of Jens Munck, sailed into Hudson Bay and wintered in the mouth of Churchill River. The ships were unprepared for a winter in the northland and consequently the crew suffered terribly from the scurvy, so that in the spring, out of 52 persons only Muck and two others survived. These fortunately procured some grasses from under the snow and as the water opened killed ducks and fish enough to give them strength to repair the smaller vessel, in which they managed to reach home.

Luke Fox.—The Muscovy Company, in 1631, decided to send out another expedition to search for a passage from Hudson Bay and instrusted the command to Capt. Luke Fox, who sailed on May 5th from Deptford in the Charles a pinnace of 72 tons burden. Having passed through Hudson Strait he landed at Cary's Swan's Nest, and then rounded the south-west point of Southampton island and proceeded to explore the channel between that island and the mainland, up to Lat. 64° 10′N., where he saw an island near the mainland which he named Sir Thos. Roe's Welcome, a name now applied to the whole channel. Fox's instructions limited him to the coast south of Lat. 63° N, so he now stood to the south along the shore, passing Marble island, which he called Brooke Cobham, and the mouth of the Churchill river until he reached the Nelson river on the 10th of August. Keeping a southerly course for a forthnight longer, he fell in with Capt. James near Cape Henrietta Maria. Having convinced himself that there was no opening to the west between Lat. 64° 30′ and 55°

10′N; Fox turned northward and explored Fox channel to the east of Southampton island, naming the prominent point on the west side of Baffin Island, King Charles his Promontory, Cape Maria, Lord Weston's Portland and Point Peregine, the last being the most northerly point reached.

James.—Captain James was in command of a rival expedition, fitted out the same year, with instructions to explore to the south of the track taken by Fox. After parting with Fox, James sailed southward to the west coast, thoroughly examined it, and after several narrow escapes from shipwreck through grounding on shoals, finally ran his ship aground on Charleton island, and there passed the winter. He gives a woeful tale of the hardships caused by cold, lack of food and scurvy.

Hudson Bay Company.—From the time of Charles I to that of George I England was convulsed with civil war and revolutions, and was also at war with other nations abroad, so that for nearly a century after Luke Fox no maritime discoveries were undertaken, and nothing would have been done in the north but for the foundation of the Hudson Bay Company.

Origin.—Two French Canadian fur traders, named Radisson and Chouart dit Groseilliers, had for a number of years traded and lived with the Indians in the country north and west of Lake Superior, in what is now the province of Ontario, where they learnt a good deal about the great sea to the north and the canoe routes leading to it. They visited its southern shores in 1659, and, on their return to Quebec, endeavoured to enlist prominent merchants there in a scheme to establish permanent trading ports on the bay, to be supplied by ships from Canada or France. Being unsuccessful, they crossed to Paris, where they found no one who was willing to advance the capital necessary to start the project. The English Ambassador, hearing of their scheme, sent them to London, where they interested Prince Rupert and several influential men of the court and city. These advanced sufficient money to outfit a small vessel under the command of Zachariah Gillam, a New England Captain, who accompanied by Groseilliers and Radisson, sailed through Hudson strait and down the bay to Rupert river. Here friendly intercourse was held with the natives, and a small fort was built in which the party succesfully wintered.

Another version, however, of the origin of the Hudson's Bay Company, states that the two Frenchmen went to Boston, New England, where they met Sir George Carteret (or Cartwright who gave them letters of introduction to King Charles.

Charter.--On the return of Gillam in 1669, Prince Rupert and his associates applied to Charles II for a charter. This was granted on the second of May 1670, to the Governor and Company of Advanturers trading from England to Hudson Bay. The charter reads: "In consideration of their having at their own cost and charges undertaken an expedition to Hudson bay in the north-east part of America, for the discovery of a new passage to the South sea, and for the finding of some trade for furs, mineral and other considerable commodities, and of their already having made by such their undertakings such discoveries as did encourage them to proceed farther in pursuance of the said desing, by means whereof there might probably arise great advantage to the King and his Kingdom, absolutely ceded and gave up to the said undertakers, the whole trade and commerce of all those creeks, seas, straits bays, rivers, lakes and sounds, in what latitude sœver they may be, which are situated within the entrance of Hudson Straits, together with all the countries, lands and territories upon the coasts and confines of the said seas etc., so that they alone should have the right of trading thither and who ever should infringe this right, and be found selling or buying within the said boundaries, should be arrested and all his or their merchandises should become forfeit and confiscated, so that one-half should belong to the King and the other half to the Hudson's Bay Company."

Fort Rupert.—In 1670 the newly formed Company sent on Charles Bayly a Governor to establish Fort Rupert at the mouth of the Rupert River, in latitude 51° 30′N., thus establishing their sovereignty by the right of the first permanent habitation granted to them by the King.

French Opposition.—The French soon felt the competition of the English trading posts of Hudson Bay and sought to oust them, claiming the territory about Hudson bay by right of dicsovery and possession. They claimed that in 1656 the Sovereign Council of Quebec authorized Jean Bourdon to make discoveries in Hudson Bay, and that he proceeded there and took possession in the name of the King of France, and made treaties of alliance with the natives. This claim is disproved by the journal of the Jesuits for that year, which relates that Bourdon sailed on the second of May, and returned on the 11th of August, having been stopped by the ice on the coast of Labrador, where a Huron Indian, accompanying the expedition was killed by the Eskimos.

The French Governor of Canada, D'Argenson, in 1661, despatched Lablon, a Jesuit missionary, accompanied by Druillette de Vallière, to the country about Hudson Bay. They travelled by way of the Saguenay but did not reach the watershed, their guides refusing to proceed on account of the Iroquois war parties that were between them and Hudson Bay. The ravages of the Iroquois were such that no travel was possible in the north until 1683, when Sieur de la Couture with five men, it is claimed, proceeded overland to the bay, took possession of the territory in the name of the King of France, noted the latitude, planted a cross, and deposed His French Majesty's Arms engraved on copper at the foot of a large tree. Sieur Duquet and Jean L'Anglois are said to have visited the bay the same year, by order of D'Argenson, and to have there set up the French King's Arms. No mention of these important expeditions occurs in the relations of the Jesuits. The first Frenchman whose visit to the bay is undisputed was the missionary Albanel, who crossed by way of the Saguenay and Rupert rivers, arriving at the mouth of the latter on the 28th of June 1672, where he found a small fort and a boat belonging to the English traders.

Forts Established.—The Hudson's Bay Company, always energetic in establishing trading posts wherever the Indians congregated about the shores of the bay, had, by 1865, small forts at the mouth of the Albany, Moose, Rupert, Eastmain, Severn and Nelson rivers. All were trading posts except eastman, were a mica mine was worked for a few years, but finally abandoned as unprofitable. No attempts were made to carry the trade inland in direct competition with the French, whose coureurs de bois the English appear to have held in great respect.

Warfare.—Many complaints were soon made to the Governor of Canada by merchants and missionaries that the English posts on the bay were ruining the fur trade and demoralising the natives; and he, knowing that no affront in this quarter would cause James II to break with Louis XIV., resolved, in a time of peace, to take possession of the English forts. The Governor accordingly sent a detachment of soldiers, under the command of Chevalier de Troyes, overland from Quebec, who, almost without a struggle, took possession of Rupert, Moose and Albany forts. This was the commencement of an intermittent warfare between French and English in Hudson Bay, which lasted until the treaty of Utrecht in 1713. In 1690 D'Iberville sailed from Quebec with two ships to capture Fort Nelson, but was unsuccessful. War having been declared between England and France in 1693, the Company, assisted by warships, retook Albany, Moose, and Rupert forts. The following year d'Iberville, with two ships and 120 men, took fort Nelson from the English; while a strong force—sent overland from Canada, easily recaptured Albany and Rupert forts. These two latter forts were a second time recovered by the assistance of the British warships Bonaventure and Seaford., in 1695 while in the following summer Fort Nelson was recovered with the aid of four warships.

Treaty of Ryswick.—In 1697 D'Iberville again visited the bay where he destroyed the English ships amongst the ice, and afterwards took Nelson, renaming it Fort Bourbon. By the treaty of Ryswick, signed in the same year, each country returned to the other all places taken during the war, and retained those captured previously, thus leaving to the Hudson's Bay Company the possession of Albany only.

Treaty of Utrecht.—Affairs remained in this condition until the treaty of Utrecht, in 1713, when the French relinquished all claims to the territory about Hudson Bay.

Exploration.—The first attempts at exploration inland was made by the Hudson's Bay Compnay in 1691, when Henry Kelsey by order of the Governor at Nelson, accompanied some Indians to the interior. From his diary, it would appear that he journeyed, in a canoe some distance up the Nelson river and then tramped overland to the open country north of the Saskatchewan.

Fort Churchill.—About 1715, the Hudson's Bay Company built a trading post at the mouth of Churchill river, and in 1740 erected a massive stone fort, which was named the Prince of Wales Fort.

Capt. Knight.—In 1719, the Company made extensive preparations for an exploration of the northern parts of Hudson Bay, and to look for gold and copper‘ etc. The expedition which sailed from Gravesend consisted of a frigate, commanded by Capt. Vaughan, and a sloop by Capt. Barlow, the chief command being entrusted to Capt. James Knight, who had been Governor of a number of forts, but who was 80 years of age. The expedition sailed from England in June, well stocked with provisions, with a frame house and a large stock of goods for trade. Their instructions were to proceed to the northward, as far as 64º latitude in search of the supposed Anian Strait. As the ships did not returto England in 1720, fears were entertained for their safety, and orders were despatched by the next ship to send the "Whalebone", John Scroggs, master, in search of them. The instructions reached Churchill too late to be acted on that season, and Scroggs, did not sail until 1722. After considerable trouble with shallo water and shoals along the coast he managed ro reach Marble Island, where pieces of wreck were found, but they were considered of no importance by Scroggs, who returned without continuing the search. Hopes were long entertained that Knight had made his way to the Pacific, and it was not until 1767 that the fate of the expedition became known. That year the Company started a whale fishery at Marble island, and one of the boats engaged in the fishery accidently discovered a harbour near the east end of the island; at its head guns, anchors, cable and many other articles were found. The wrecks of the ships lay in five fathoms of water, and the remains of the house were still in existence, with two skulls on the ground near by. Hearne learned from the Eskimos that the ships arrived late in the summer, that the larger one received much damage entering the harbour, that soon after arriving the house was built and that the white men numbered about 50. When the natives again visited them. during the following summer, their number was greatly reduced, and the remainder were unhealthy. The carpenters were then at work on a boat. By the beginning of winter the number was reduced to 20, and in the following summer only five remained alive, all of whom died within a few days after the arrival of the natives. That such a disaster, says Low, could occur within 250 miles of Churchill is astonishing at the present day, when so much more is known of the comparative ease with which long journeys may be made over the ice and snow in the spring time.

Crow and Napier.—In the beginning of July, 1737, Messrs Crow and Napier sailed from Churchill on a voyage of discovery, but they merely went to Whale Cove, where they traded with the Eskimos. Whale cove is said to have derived its name "from a whale having carried one of the Company's sloops to sea, by its tail getting foul of the anchor and cable". Napier died during the voyage and Crow returned to Churchill.

Capt. Middleton.—In 1741, Captain Christopher Middleton in the Furnace, a slopp or bomb-ketch, and Mr William Moore in the Discovery, a pink, sailed from England in search of the North-west passage, which they hoped to find near the north-west angle of Hudson Bay. They spent the winter at Churchill, where the Hudson Bay Company was engaged in building a massive stone fort. The next summer they sailed north and discovered Wager Inlet and Repulse Bay, where they turned southward to "Brooke-Cobham" or Marble Island. On August the 12th, 1742 John Rankin, the Lieutenant of the Furnace, discovered and explored the harbour on the south side of Marble Island which afterwards became the headquarters of the whaling fleets which every year visited the bay.

Arthur Dobbs.—About this time, one Arthur Dobbs, a zealous and enthusiastic advocate of the north-west passage, had influence enough to procure the passage of an Act of Parliament, offering a reward of £20,000 for the discovery of a notrh-west passage; and was also instrumental in raising sufficient money to outfit two ships to earn the reward. The Dobbs, of 180 tons was commanded by Capt. William Moore, who had been in charge of the discovery on the previous expedition, and the California of 140 tons in charge of Captain Francis Smith. They sailed from England on the 20th May, 1746 and wintered at Port Nelson. The next year on July 26th, they discovered Chesterfield inlet which they sailed up as far as an overfall or cascade when they were discouraged from proceeding further, because the water "from being salt, transparent and deep, with steep shores; and strong currents, grew fresher, thicker and shallower at that height." After obtaining this information about Chesterfield Inlet, the two ships sailed northward and re-explored Wager Inlet, and then returned to England.

The explorations of Fox, Moore and Smith had shown that there was no hope of a North-west passage from the west side of Hudson Bay south of Repulse Bay, except possibly by Chesterfield or by Corbett Inlets, the bottoms of which had not been visited.

Capt. Christopher.—To settle the question, the Hudson Bay's Company sent Captain Christopher in a sloop to examine Chesterfield Inlet again in 1761. On his return he reported that he had navigated the inlet for more than 150 miles in a westerly direction, until he found the water fresh, but had not seen its end. On this Mr Norton was sent in 1762, to trace it to its extremity which he did and found it to end at a distance of 170 miles from its entrance, in a freswater lake 72 miles in length and from 20 to 22 miles wide. In 1791 Capt Charles Duncan examined, for the Hudson Bay Company, Corbett's or Rankin inlet, which proved to be a bay, and Chesterfield Inlet which he found to agree with Norton's description.

Hearne.—Prior to Samuel Hearne's wonderful overland journey the country to the West of Hudson Bay had remained unexplored, for in it valuable fur-bearing animals are scarce or in most place almost entirely wanting, and fur-traders had, therefore, not penetrated into it, become familiar with its waterways, or marked out its portages. Its lakes, streams, and mountains had remained unknown. No trading posts had ever been established in it, and its beauties and dangers were wrapped in the deepest mystery. North of the limits of the woods it had never been crossed by civilized man. Reports were brought in to Churchill of the existence of great quantities of native copper in the banks of a stream far to the north where the Indians were said to procure the metal of which their implements and cooking utensiles were made. About the same time the Hudson Bay Company was subjected to severe criticism and violent censure in England on account of the constant assertions, and growing belief, that the Company was strongly opposed to any investigation or exploration of the interior country, back from the shores of Hudson Bay.

Accordingly Samuel Hearne, a clerk at Fort Prince of Wales the strong fortress on Churchill River, was sent with some Indians, in the Autumn of 1769, to look for the Coppermine River and the deposits of copper ore on its banks. He went but a short distance up Seal River when the Indians deserted him and he was obliged to return, having been absent 36 days.

On the 23rd of February, 1770 he again started and wandered westward as far as Yath-kyed Lake. From Yath-kyed Lake he accompanied a large band of Indians hunting caribou and the season becoming so advanced his Indian guide refused to accompany him to the Coppermine River. The Indians plundered him of almost all his possessions and to complete his decomfiture his sextant was blown over by the wind and shattered. He therefore had to return to Churchill, which he reached on November 25th, "after having been absent eight months and twenty-two days, on a fruitless or at least unsuccessful journey."

Twelve days afterwards, having obtained new guides, Hearne again set out for the Coppermine River, but on this occasion he avoided the Barren Lands as much as possible. He left Churchill on December 7th, 1770 and travelling by way of Kasba, reached the Coppermine River on July the 15th, 1771. He returned by the same route to Churchill which he reached at the end of the same year. The record of his travels was published in a volume entitled "A Journey from Prince of Wales Fort, in Hudson Bay, to the Northern Ocean" by Samuel Hearne, Dublin 1796.

Hearn's book gives an exceedingly interesting account of life among the Indians at that time, and the animals and birds found in the vicinity of Churchill, but it contains very little information about the character of the country over which he passed and nothing about its geology.

North-west Company.—This ended for many years Hudson Bay Company's attempts at northern exploration, their undivided energies being required to maintain the trade struggle with their energetic rivals, the North-west Company.

Previous to the conquest of Canada, the French fur traders had carried their trading posts beyond the great lakes and across the wooded foot of the rocky mountains. Shortly after the cession of Canada to the British, a number of Scotch and Canadian merchants acquired the rights of the old French company and, under the name of the North West Company, prosecuted the trade with such increased vigour, that they greatly diminished that of the Hudson Bay Company, who in self-defence were compelled to establish trading posts inland close to those of their rivals. In this manner the interior of British America was soon dotted with trading stations that extended over the whole territory from the bleak shores of Labrador to and beyond the Rocky Mountains and as far north as the Great Bear Lake and the mouth of the Mackenzie River. The strong rivalry for furs soon led to collisions between the partisans of both companies, and blood was often shed; the natives were debauched with liquors, and general lawlessness continued until the amalgamation of the two companies in 1820.

Revillon Freres.—In recent years Revillon Freres, the largest

Fur House in Paris have established over a hundred fur-trading posts round Hudson Bay, in the Northwest and Mackenzie country and are cutting heavily into the profits of the Hudson's Bay Company.

Harry A. Auer writing in Field and Stream, March 1914, says: —"The competition between the Hudson Bay Company and Revillon Freres has had the effect of raising the prices paid to Indians for furs, without particularly bettering the Indians condition except to increase his extravagance. No longer is he content with the birch-bark canœ, but must have one of the numerous Peterbourough canœs brought out by the Hudson's Bay company steamer through Hudson Straits; only a latest model Winchester satisfies his need for a gun, which with canœ he obtains easily on credit at the Hudson's Bay Company, with result that he never cleans his gun and takes no care of his canœ, so that the following year both are useless and he must acquire a new outfit, also on credit. This credit system instead of being beneficial to either the Indian or the trading companies is detrimental to both. The Indian obtains credit at the Hudson Bay Company for his known ability as a hunter, then gœs to Revillon Freres Post and obtains like credit, indulging in all sorts of extravagances and useless and frivolous purchases. The following spring furs are sufficient to pay off only half the debt to each company. As a result of this condition both companies, knowing that the Indian will pay only about half his dept, charge higher prices for the goods he purchases and pay him the lowest prices for the furs he sells. The Indian having obtained credit so easily is exceedingly prodigate and extravagant, and were the credit system abandoned as it has been in the western territory the Indian would be less extravagant and having no debt would be in better position to sell his furs at better prices, while the trading companies, not having to consider the large debt, would be in position to pay better prices for furs.

The Hudson Bay in return for large concessions of Government lands in the West and certain exemption of taxes has since the Confederation of the Canadian Provinces ceded its sovereign rights over the shores and waters of Hudson Bay to the Government of Canada.

In 1911 the International Court of Arbitration at the Hague recognized and awarded the sovereignty and sole jurisdiction of the waters of Hudson Bay to Canada, as the United States had for some time maintained that Hudson Bay was not a mare clausum. In 1903 the Canadian Government dispatched the Neptune under the command of Mr A. P. Low to establish a permanent station at Fullerton at the entrance to Rœ's Welcome, 5 miles south of Cape Fullerton and north of Chesterfield Inlet, for the purpose of asserting its authority, attending to the collection of customs, the administration of justice and the enforcement of the law as in the other parts of the Dominion. To perform these duties Major Moodie, of the North West Mounted Police was appointed Acting Commissioner of the unorganized Northeastern Territories, now called Franklin Territory.

Capt. Lyon.—In 1824 Captain Lyon, in the Griper, made an unsuccessful attempt to continue the work of Parry and himself in Fox Channel. He left England on the 20th of June, rounded Southampton island on the 30th of August, and stood up Rœ's Welcome, where exceedingly bad weather was met with. He reached Wager inlet on the 12th of September, and when riding out a gale lost his two anchors, while the ship was rendered very leaky. In such a state he was unable to anchor, and was obliged to return home immediately.

Capt. Back.—A second attempt to continue Parry's work in the same region was made by Capt. Back, in 1836. He was in command of the "Terror" and left England on the 14th of June. On the first of August he was among heavy ice, off Resolution Island. On the 23rd, he was working through heavy ice on the east side of Southampton island, and finally nearly reached Repulse Bay, where he intended to winter, when he was driven back late in September, past Cape Comfort, out into the middle of Fox Channel, where the ship became fast frozen in, and drifted all winter at the mercy of wind, tide and ice. Toward the close of February the floe broke up, and the ship was caught in a pressure ridge formed between great pieces of the broken floe. In this manner the vessel continued to be tossed about and squeezed until the 16th of March, when an extra heavy squeeze lifted the ship up and left her stranded on the top of a great mass of ice, caused by the piling of large broken cakes upon one another. The Terror remained embedded on this mass of ice, and drifted with it until released on the 13th of June, near Charles island in Hudson Strait. Notwithstanding the terrible usage of the ship, Back managed to calk and fit her, so that he reached the coast of Ireland, but there had to run the ship ashore to prevent her from sinking.

Dr John Rae.—In 1845 Dr John Rae, in the employment of the Hudson Bay Company, journeyed by boat up to the west coast of Hudson Bay, from Churchill to Repulse Bay, where he passed the winter, supporting his party mainly by his own skill in hunting. The following spring (in 1846) he portaged his boats, by a number of lakes, across the Rae isthmus to the bottom of Committee Bay, and surveyed the southern part of the Gulf of Boothia and the west coast of Melville Peninsula as far north as Cape Crozier. He did not go quite as far as Fury and Hecla Strait. The object of Rae's journey was to survey the coast line between the mouth of the Back or Great Fish River and Regent inlet in order to see if there was a passage for ships between the Gulf of Boothia and King William Sea. Dr Rae returned in his boats to York factory in the autumn of 1847, without losing a man of his party.

Description of Hudson Bay

Area.—Hudson Bay is 500 miles long and wide with an area of 250,000 square miles, and Fox Channel is 450 miles long and has an average width of 200 miles, and an area of 90,000 square miles. Hudson Strait is 500 miles long and 100 miles wide, with an area of 50,000 square miles. The eastern entrance between Cape Chidley and Resolution Island is 50 miles wide. The only other outlet is Fury and Hecla Strait in the northwest corner of Fox Channel wirh a length of 100 miles and a width of 20 miles, with an area of 2,000 square miles. Ungava Bay is 150 miles deep and 140 miles wide, with an area of 21,000 square miles. James Bay is 250 miles long, 120 miles wide with an area of 30,000 square miles. The combined area of the waters of Hudson Bay and adjacent bays and straits is 443,000 square miles, and, excluding Hudson Strait, is about the size of the Province of Ontario. Hudson Bay, from the south shore of James Bay in latitude 51° 20′N., to the north shore of Fox Channel in latitude 70° N., is 1,300 miles long; the distance from Port Churchill to Port Burwell is 1,150 miles, and from Port Churchil to the mouth of the Nottaway River, in James Bay, is 900 miles.

Origin.—Dr Robert Bell of the Geological Survey of Canada in his report of his voyage to Hudson Bay in 1897, writes: "Fox Channel and the southern part of Fox Basin is a continuation of Hudson Strait, and the deep submerged valley in which they lie has a straight northwesterly course of 700 miles. Hudson Bay is comparatively shallow. The bottom is very even and from 70 to 100 fathoms in depth over great areas. Its outlet falls, at right angles, into the channel of Hudson Strait, in which the soundings range from 200 to upwards of 300 fathoms. The origin of the straight and deep depression in which Hudson Strait and Fox Channel lie, is probably of very ancient geological date. In the great Archaean regions of Northern Canada, the long straight channels and numerous narrow lakes and direct river courses are due to erosion commenced along decomposing dykes of igneous rocks, and the depressions so formed have, in some cases, been subsequently enlarged from time to time by denudation. Sometimes a group of dykes or fissures produces the same effect as a single dyke. The depression of Hudson Strait and Fox Channel may have originated in the same way.

"In preglacial times, when the northern portion of the continent was elevated considerably above its present level, this valley was situated on the dry land probably as far down as the existing general line of the Atlantic coast. as its depth increased from northwest to southeast or from the interior to the ocean, and the ice-sheets of the glacial period moved from the high land on both sides directly towards and into it and then down the valley itself, as shown by the striation and the material of the drift. The few soundings which have been taken eastward of the mouth of the strait would seem to show that its channel continues outward in the same direction, in the bottom of the sea, with comparatively shallow water immediately south of it. The latter section is overlooked by the mountains running in that direction from Cape Chidley. A preglaçial river, exceeding any in size of those at present existing in North America and whose branches traversed the dry bed of Hudson Bay, coming together in its north-eastern part, probably flowed down this valley into the Atlantic."

Cambro-Silurian Sea.—Low writes:—"The western Cambro-Silurian Sea filled the present depression of Hudson Bay, and extended forth to the south and westward of its present limits, outliers of limestone containing fossils of this age, and very similar in mineral character, being found in the valleys of the great lakes of Manitoba. From Manitoba these rocks have been traced southward into the United States, so that at the time of their deposition the Cambro-Silurian Sea occupied a great basin open to the Arctic Ocean and extending southward into the middle of the continent."

Land Uplift.—Tyrrell reports:—"Whether the land round the shores of Hudson Bay is still rising or whether it has now reached a condition of stability are interesting questions. In 1733, the Hudson Bay Company began building the massive stone fortification, which they call Fort Prince of Wales, on the summit of the low point west of the entrance to Churchill Harbour. The fort is surrounded by a gravel-covered plain or terrace, and the base of its walls is now seventeen feet above ordinary spring tide, and the top of the shingle beach, that is now regularly washed by the storm-waves at ordinary spring tides, is only six feet below the base of the walls. If the land had been eight or ten feet lower in 1833 than it is at present, the storm-waves with high spring tides would have regularly washed over the point, and it is not likely that a structure of any kind would have been built there, for the place would have been a disagreeable and dangerous one."

Tyrrell also measured the height of certain names, including that of Samuel Hearne, which were carved in the months of May and July, 1741, 1746, 1748, 1753, 1757 and 1767 on the rocky walls of Sloops Cove in Churchill Harbour, the rock having been planed smooth by the second glaciation from the south-west. He came to the conclusion "from the present height above sea-level of these names and of the ancient mooring rings for ships that were leaded into the rock, that there would here be evidence of the rise of the land to the extent of two feet in the last century and a half, but as neither of these points are certain the evidence in favour of this rise is too indefinite to be considered at present. The positions and states of preservation of these rings clearly indicate that there has been no great change in the relative heights of land and water since the molten-lead was poured round them as they were set into the rock."

Glacial Phenomena

Glaciers.—The lands fronting upon Hudson Bay and Hudson Strait are now free from glaciers, the nearest approach being the occurrence of detached snow banks in protected positions, which remain throughout the year. The most southern glacier is the Grinnell glacier situated on the north side of the high land separating Hudson from Frobisher bay, and plainly seen crowning the summit of the north shore of Hudson Strait for a distance of more than fifty miles. This glacier is not very active, and is said to discharge only a few small icebergs into one of the fiords on the south side of Frobisher bay.

Low says.—Tyrrell's observations on the glacial phenomena of the barren land region west of Hudson bay show that the country was intensely glaciated; that the centre of glaciation was on a nearly level plain now eleveted some 400 or 500 feet above sea-level, there being no evidence to show that it was much more elevated during the period of glaciation. The centre of ice distribution was situated close to the western shores of Hudson bay, and the moisture sufficient to allow of such an accumulation of ice was probably derived from an open Arctic sea. The glacier moved south and southwest from this centre up a gradual grade to Manitoba, where morainic accumulations are found on the summits of the Duck mountains at elevations from 1800 to 2400 feet above present sea-level. Striae evidently formed by moving ice from this centre have been found by the Dr Barlow and by the writer (Mr A. P. Low) on the branches of the Moose river to the south of James Bay, where the movement was from the N. W.

Erratics.—"There is little doubt that the ice also moved northward from the centre of glaciation, and that the evidence quoted above of the erratics found in the western Arctic islands is proof of this.

"Little or no attention was given by the earlier explorers to the markings of ice-striae and other glacial phenomena, and the only

Baffin Sea Iceberg

records of the movements of the glacial ice noted by them was the distribution of erratic boulders. These observations have been summarized by Dawson as follows: "Along the Arctic coasts, and among the islands of the Archipelago, there is a considerable volume of evidence to show that the main direction of movement of erratics was northward. Thus boulders of granite supposed by Prof. Haughton to be derived from North Somerset are found 100 miles to the northeastward, and pebbles of granite identical with that of Granite point, also in North Somerset, occur 135 miles to the northwest. The east side of King William Land is also said to be strewn with boulders like the gneis of Montreal island, to the southward. Near Princess Royal Island, in Prince of Wales Strait, and also on the coast of Prince of Wales Island, the copper said to be picked up in large masses by the Eskimos may be supposed to be derived from the Cambrian rocks of the Coppermine River region to the south, as it is not probable that it occurs in place anywhere in the region of horizontal limestone where it is found."

Much of this drift is however carried from place to place in the Arctic sometimes a thousand miles from the place of origin, by isolated icebergs which are driven by the wind and current from one island to another as an instance of this on the top of a huge iceberg, which stood 100 feet out of the water and was 45 acres in extent and which was frozen in and spent the winter in Eclipse Sound, opposite Salmon River, several large gneis boulders containing we found hornblende, mica and feldspar, with undisturbed earth and loose pebbles on top of them. Boulders found along the Arctic shores may have travelled from a long way off before being dropped from a tilting or broken iceberg.

Centre of Glaciation.—Low writes: "From a study of the different sets of glacial striae, Tyrrell concluded that the centre of gravitation was, in the early part of the glacial period, somewhere to the north and west of the head of Chesterfield inlet; that later, when the ice incresaed in thickness, the centre of the dispersion moved to a position southwest of Baker Lake; while as the glacier diminished, the centre moved nearer the seashore, and the final stage was probably represented by the ice-cap breaking up into a number of distinct glaciers, each with a local movement of its own."

'These conclusions of Tyrrell as to the southern movement of the centre of glaciation were borne out by Mr Low's observations along the shores of Roe's Welcome, where the direction of the striae showed that the earliest accumulation of ice in the region north of the western side of Hudson Bay was somewhere to the northwest; this was followed by an abrupt change in the ice-movement, as the ice-cap gradually shifted, by way of north, to north-west. Mr Low is of the opinion that the centres of dispersion were much greater in area than the limits placed upon them by Tyrrell.

Labrador ice-cap.—"This southern movement of the centre of dispersion of the ice is diametrically opposite to what occured in the case of the ice-cap of Labrador, where the striae along the east side of Hudson bay show that the centre of ice-movement changed from a position near the central area of the peninsula, a short distance north of the southern watershead, to one some three hundred miles north, in the vicinity of the headwaters of Koaksoak River.

"The glaciation of Labrador seems to have been later than that of the western side of Hudson bay, as the striae from the western glacier are almost obliterated by those from the east and north-east along the rivers south of James Bay.

ICE IN HUDSON BAY

On this subject, Low writes: 'The mainstream of the Arctic current passes southward across the mouth of Hudson strait, and forms the northern current of the Atlantic coast of Labrador. It bears on its surface the wide stream of ice which in summer forms the "middle pack" of Baffin bay, and which later in the year, beginning late in October, passes the mouth of Cumberland gulf and Frobisher bay, and in November or nearly in December closes the easthern entrance to Hudson strait. At that time a considerable area of this northern ice may enter the eastern part of the strait, but is prevented from completely filling the strait by the amount of locally formed ice already covering its waters. Continuing southward on the current, this stream of ice, often upwards of fifty miles in width, blocks the coast of Labrador during the early months of the year, and by the end of March arrives off the coasts of Newfoundland, bearing on its surface an immense number of newly born seals to make the important fishery of Newfoundland. Part of this ice is carried through the strait of Belle Isle into the northern portion of the Gulf of St. Lawrence, while the greater portion passes south along the east coast of Newfoundland to Cape Race. Here the western part of the ice is deflected to the westward along the southern shores of the island, and finally enters the southern part of the Gulf of St. Lawrence, while the remainder is soon melted in the warmer waters of the Atlantic south of Newfoundland.

Ice forms in Hudson Bay.—"Ice commences to form in the smaller bays of the northern parts of Hudson bay and Hudson Strait early in october, and by the end of that month the northern harbours are frozen over. The more southern ones, especially those of the mouths of the large rivers, do not close until late in November or early in the following month. By the beginning of

January, James bay is frozen across, and at the same time solid ice usually extends from the east coast of Hudson bay to the outer line of islands, some sixty to 70 miles from that coast. In other parts of Hudson bay and in Hudson strait a margin of solid ice usually extends from one to 5 miles from the shore except where the coast is high and bold with deep water close to the base of the cliffs. In such places, especially at headlands, solid ice does not form, and the natives in winter often have to make long and difficult detours inland to pass them.

Hudson Bay does not freeze.—"The main body of Hudson bay does not freeze solid, and the same may be said of Hudson strait Although this is the case, these waters are quite unnavigable for ordinary ships during the winter and spring months owing to the great sheets of heavy ice borne backwards or forwards by the tides and currents, and drifted about by the winter gales. There is a little doubt that a specially constructed ship for ice navigation might pass through Hudson strait at any season, but the voyage would be a long one, and the difficulties and dangers would be great.

Character of ice.—"If a single thickness of sheet-ice, writes Low covered the northern waters (Hudson Bay) they would be completely clear early in July, but unfortunately much of the floating ice is "afted" or piled up, sheet on sheet, and the whole cemented solidly together to form large masses often 20 feet or more in thickness. This rafting is caused by the pressure formed by large masses of ice driven together, or against ice attached to the shores, which causes the ice along the margins to break and buckle, cake on cake. These pressure areas are often of considerable size, and usually are many times longer than broad. They serve as a framework to hold together large fields of single sheet ice. When the thinner ice melts, these pressure masses remain, and are dangerous to shipping until the water has become sufficiently warm to melt the ice cementing the cakes together; then they are harmless and fall to pieces with a great commotion, but with little danger. This desintegration is known as "calving".

"The northern ice which occasionally enters Hudson strait in the early part of the winter as before described, is much more complicated and much heavier in character than the local ice. Some of this ice may be met with in the earlier period of navigation to the eastward of Big island, and should be treated with respect. The icebergs included with it often remain until late in the season, and form a source of danger in foggy weather, but they are usually so few as to be negligable, especially in the western half of the strait".

Early navigation.—The Diana, a Newfoundland sealing steamship, built especially for work in heavy ice, was chartered by the

Canadian Government in 1897 for the purpose of testing the period during which Hudson strait is open for navigation. Dr Robert Bell, of the Geological Survey, accompanied the party. The Diana sailed from Halifax on June 3rd, and passed through Belle Isle strait, where the first heavy ice was encountered. On the way northward along the Atlantic coast more or less delay was occasionned by the heavy pack drifting southward,and the eastern entrance of Hudson strait was not reached until the 22nd of June. Further delays by ice, especially in the neighbourhood of Big island, near the middle of the strait, prevented the Diana from passing into the open water of Hudson Bay until the 12th of July. Returning immediately, an attempt was made to land Dr Bell's party in the vicinity of King Cape on the eastern side of the mouth of Fox Channel, but owing to the great quantity of heavy ice about Salisbury and Nottingham islands and to the northward, it was found impossible to do so, and the ship was headed east, to land the party at the first convenient place on the southern shore. This would go to show that the entrance of Fox Channel is not clear of ice before the month of August.

CURRENTS IN HUDSON BAY

Direction of Currents.—"Some knowledge of the currents writes Low, is desirable in discussing the navigability of Hudson Strait and Hudson Bay, for on them largely depend the character and amount of ice met with in these northern waters. Observations on the drift of the ice that covers the Arctic Seas point to a general law governing the currents. This law, briefly stated is no matter what the size, shape and direction of one of these northern bodies of water may be, the direction of flow of the current will be such that one facing with it will have the land on the right hand. This may be differently stated by saying that with bodies of water having a general north-and-south trend, the current will flow north on the east side and south on the west, while in east-and-west bodies the direction of flow will be west on the north side and east on the south side.

"The current flowing westward along the north side of the Hudson Strait sweeps northward up the east side of Fox Channel, round the head of that large northern bay and then flows southward along the east side of Southampton, bringing with it the heavy ice from the northern parts of Fox Channel, so that heavy drift ice is almost always found to the north of the eastern entrance to Evans strait, and often comes sufficiently south to partly block the channel between Mansfield and Coats islands."

Fox Channel.—The Eskimos of Igloolik stated that the east and centre of Fox Channel are quite clear of ice during the months of August and September, but that the southerly currents of Fury and Hecla Strait and the deflection south of the northerly current which flows along the western shore of Baffin Land sweeps the ice on the shore and blocks the entire east coast of Melville Peninsula from Cape Arlagnuk to Frozen Strait, which also was Parry's Experience.

West shore of Hudson Bay.—"The current from the north along the western shores of Hudson Bay is not important as regards navigation, as it comes from the narrow waters of Roe's Welcome and does not transport a large quantity of field ice.

Currents in Baffin Bay.—"Similar currents follow the shores of Baffin Bay and Davis Strait; on the east, or Greenland side, the flow is northward, while along the west side or that of the Arctic islands the current is southward, and carries on its surface great quantities of heavy field ice formed in these northern waters, together with extensive masses of Arctic ice which have passed south or east through the wide sounds connecting the northern parts of Baffin Bay with the Arctic ocean. Many icebergs discharged from the northern glaciers are also found in this heavy ice of the middle-pack of Baffin Bay and Davis Strait. This Arctic current closely follows the eastern shores of Baffin island, branches of which sweep into Cumberland gulf and Frobisher bay. When it reaches the latitude of the mouth of Hudson strait, the part adjacent to the land turns westward through the channel between Resolution island and the north shore of the strait, while another stream sweeps westward around the island of Resolution, where, meeting the current flowing out of the strait, the strong cross currents, tides and "overfalls" noted by the earliest navigators are formed".

Navigation of Hudson Bay and Straits

Period of Navigation.—Commander A. B. Low, in command of S. S. Neptune, who wintered at Furlerton in 1905-06 said that the period of safe navigation for ordinary iron steamships through Hudson Strait and Hudson Bay to Port Churchill may be taken to extend from July 20th to November 1st. This period may be increased without much risk by a week in the beginning of the season and perhaps by two weeks at the close.

Captain Bernier reports in 1904 that Port Churchill is often still open in the first weeks of November, and could easily be kept open with an ice-breaker if desired.

Hudson strait and Hudson bay do not freeze solid, but are so covered with masses of floating ice as to be practically unnavigable for at least seven months in the year. The ice does not begin to melt until well into the month of June, and it is not sufficiently melted for safe navigation with ordinary steamers until the middle of July. No ice is formed in the strait and bay sufficiently heavy to obstruct ordinary navigation until the latter part of November, but towards the close of this period there is danger from the early passage of the northern pack from Baffin Bay and Davis Strait across the north of Hudson Strait, and, also, to a much less degree from Fox channel partly closing the western entrance to the strait.

Captain Adams who has frequented Hudson Bay and the northern waters in command of a whaling ship for 35 years, says that the strait of Hudson is navigable in round numbers for about four months every year. Captain A. B. Fisher stated that he had visited the strait and bay several times on different vessels since 1864 and that in his judgment the strait can be navigated from 3 to 3½ months each year by steamers for commercial purposes. Mr Beach, who spent 1905 and 1906 at Churchill states that a steamer left Port Churchill on October 24th'1905 and made the trip across the bay and through Hudson Strait to St. John's, Newfoundland in eleven days. The straits were wide open until that date. The bay is open all the year round and was still open when he left on January 3rd. The average date for the closing of navigations for the eastern entrance of Hudson strait is about the last days of October; while the opening of Port Burwell is about July 15th. In the spring of 1905 Capt. Bernier reports that he left Fullerton Harbour about the 5th of July in the Canadian Government ship "Arctic" and he encountered ice fields outside of Churchill, 60 miles north; a strong steamer could have passed through and have entered Port Churchill. In the 3 successive years, 1905, 1906 and 1907, he entered Fullerton on October 16th and saw no field ice in the strait but saw a couple of icebergs. There was no ice in the bay, and the ice in the harbour of Fullerton was only 4 inches thick.

Aids to Navigation.—With the proper aids to navigation the dangers would not be so great during the fall. With wireless telegraphy at a station at the entrance of Hudson Bay, the opening of navigation could be made in the first week of July; by informing the steamers which side of the strait to pass on so as to find clear navigable water. In this way much detention would be saved in the first part of the month of July. There is no doubt that the strait is navigable four months of the year, with suitable steamers; and that Hudson Bay is navigable for one month longer, though there is a large field of ice in the bay, which is the output of the land ice, and is over the year's formation, through which a suitable steamer would have to pass to reach Port Churchill.

Fogs.—When the temperature of the air falls several degrees below zero, as it does in November, a thick mist or fog rises from the open water and renders navigation somewhat dangerous. In the early part of the season before the ice has completely melted, fogs are liable to occur in proximity to the ice-fields. At other times fogs are not prevalent, and the weather is ordinarily fair. The worst storms occur from the south and east, and these are usually accompanied by rain in the summer, and by snow later in the season. Northerly winds bring clear cold weather as a rule.

September weather.—Mr Tyrrell when travelling in canoes along the west shores of Hudson Bay, from Chesterfield Inlet to Port Churchill in September 1894 reports the weather in that month as being constantly overcast with a dull. leaden sky and in the latter days of the month it snowed every day. The fresh water ponds were frozen over and the subarctic winter was rapidly closing around them; and ice formed on their paddles in the clear cold wind.

Navigation of Hudson Strait.—"Ships entering Hudson Strait, from the Atlantic during the early part of the season writes Low, when ice is present in the strait, should keep in the northern half of the channel between Resolution and the Burton Islands. Care should be taken to keep some miles from Resolution, as the strong currents close to the island cause the ice to come together and open again with considerable violence. The north side of the strait should be followed as far as Big island, keeping at a respectful distance from the land in order to avoid pressure when the ice is pressed on the land by southerly winds. There are frequently large quantities of ice in the neighborhood of Big island with at times considerable pressure; on this account ships should not approach close to the island. From Big island the course should be so laid that the ship may pass a few miles to the northward of Charles island, and from there the middle channel should be followed to pass between Nottingham island and Cape Wolstenholme. The southern side of the channel between Mansfield and Coats is usually freer of ice than the north side.

In passing eastward through Hudson Strait advantage should be taken of the favourable current on the south side, and that shore followed to Charles island, where the channel to the south of the island may be used, taking care to keep well away from the mainland until Cape Weggs is passed. The southern half of the centre channel should then be followed to beyond Big island, when the mid channel across the mouth of Ungava bay will probably be found clear of ice.

Eastern Entrance.—The heavy tides of Ungava Bay exhaust themselves in the passages between the Button islands, and, in doing so, cause very dangerous currents. Gray strait, lying between Cape Chidley and the inner Button islands, would form an excellent ship canal, if it were not for these strong currents which cause a dangerous sea when the tide is running against the wind especially when the wind is eastward and the Atlantic swell heaves into the strait.

At present the Eastern part of Ungava Bay has not been surveyed; it is studded with unknown islands, even the Button Islands are more numerous than what they are on the chart. It requires skilful navigation on account of the strong tide coming in and out of the strait, as the soundings are very deep even close to the shore; a sharp look-out has to be constantly kept and the position must be very accurate.

CLIMATES OF HUDSON BAY

Climate.—Samuel E. White in his "Tale of the North" gives the following good description of the climate in the regions round Hudson Bay: In summer is a world of riotous vegetation, of prodigal bloom, of droning insects, calling birds winnowing butterflies, and the warm gliding of rivers, with the suddenness of birth summer spring from the womb of Labrador. July suns eat the snows and spew the floods. July days stain the hillsides with millions of ripened berries and scatter strange rare flowers through the valleys. Geese, ducks, loons and other waterfowl float downing broods upon the waterways. The osprey loads the young hawk through the air. The ptarmigan scurries a gray shadow trailed by little gray shadows, in the thick cover.

"Abroad in the land forage the Arctic fox, the black fox, the lynx, the wolf, the bear, all ravenous, all predatory, seekers after the weaker lives. For the beast who was stronger survived. The one weaker fell. Thus the iron country worked out its iron course of natural selection, called its chosen, standardized its strain. All by summer moved the vast herds of caribou, hundreds of thousand strong in annual migration.

Winter.—"But now the bitter winter has come and he who journeys the Barrens in Winter sets himself a Titanic task, for every mile of the waste has to be literally won. Before winning each mile, it is necessary to thrust back the grim, unseen antoganist. Here was the season that thrust crises upon all living things, the Winter, the final lash to smite down the frail. From the Height of Land of Ungava Bay will be waged a battle for existence. From Hamilton Inlet to the East Main would the conflict spread. How well the Barrens deserved its name? In it was no movement, sound, or life except that which came to it extraneously. The snow fell upon it, the wind howled over it, daring feet crossed it occasionally, but organically it was dead. Its plane lay relatively flat, tilting like a lid. In its vast loneliness, entirely without contrast or detail, it seemed the dull, pulseless surface of a planet that has cooled.

"As if their watching drew the storm, it fell howling at the close of the blustery afternoon. All night a terrific gale rocked the camp, pelting like stinging drift of hail. The storm was swooping swiftly. The sledge track was filled with swirling snow. The wind began with terrific pressure to lift Lavergne's bending figure. Each bellowing gust threw him back to the perpendicular, held him there, buffeted him from side to side, and by a sudden withdrawal of its strength almost pitched him on his head. Continually it charged and retired erratically, until at last it poured in a steady, ever increasing blast, a perfect torrent of wind whose only suggestion was greater fury behind. The sun went out, clinching with the storm giants which rioted across his zone, and the ruthless feet of those giants made all the Barrens smoke Pallor, gloom, night fell over the world like three successive blankets. The unearthly tempest put such a pressure upon things as bore them to the ground. All outer space might have been a gigantic funnel and all the winds of all the worlds herded into it to blow upon him at the funnel spout.

"All the next day it raged and another and yet another. Then the heavens showed brittle, cold and clear. The wind had packed the snow solid. The frost was intense.

"Driving the huskies with a long whip made of twisted hide, they left the silent, sealed river and headed into the silent, sealed hinterland. Above, below, behind, before was silence, awe-inspiring, deadly. The commotion they aroused in passing, made dog pant, snowshoe crunch, sled creak, echoed faintly in the interminable void.

"As they quitted the spot which had been their temporary abode and forged on where was no abode, where was nothing but snow, the sky, and the cold, the spirit of the wild asserted itself. They had the impression that amid the white loneliness they were not alone. A presence, vague, inimical, strong, was out against them. The foe they had defied, whose fuel they had burned, whose meat they had plundered, whose waters they had trespassed, was at last arisen. That foe was giving a hint of its might."

Small wonder, then, that the storm-driven, snow-bound. Eskimos hold, Tornarsuk, the Storm Fiend, in fearsome awe and dread that outweighs belief in a more powerful Deity.

RESOURCES OF HUDSON BAY

Mineral resources.—The mineral resources of Hudson Bay, so far discovered, are:

Gold.—In Wagner Inlet discovered and reported by Dr Rae in 1553: and Mr Caldwell in 1903.

Iron.—In the Nastapoka islands, reported by Dr Bell and Mr A. P. Low, of the Geological Survey of Canada.

Copper.—On the west coast of Hudson Bay, south of Chesterfield inlet, reported by J. Burr Tyrrell.

Graphite.—Extensive bands, or veins of this mineral were discovered by Mr Caldwell to the south of Port Burwell along the east shore of Ungava bay.

Mica.—On the north side of Hudson Strait at Lake Harbour, where work isbeing carried on by a Scotch Company in connecting with the whaling steamer Active. In 1903 thirteen tons of excellent mica were taken out of the mine during the summer months.

Coal.—There is none in Hudson Bay.

Gold and Diamonds.—Prospectors in 1912 reported having foundplacer gold and diamonds along the banks of the Eastmain River that flows into the east-side of James Bay, but nothing further has, apparently, been found in corroboration of the rumoured discovery. The Jesuits have also reported the existence of Indian legends as to their existence.

Silver.—A small quantity of silver is found in the galena, which occurs in pockets in the limestone along the whale river coast on the east side of Hudson Bay. Low states that the amount of galena is small, and so widely scattered that it would probably be unprofitable to mine even under favourable circumstances.

Aluminum Clay.—Is also reported to exist in large quantities in the vicinity of the Eastmain river.

Magnetic Pyrites.—A considerable amount of magnetic pyrites was found in the squeezed diabase rocks along the east coast of Hudson Bay, but careful analyses failed to show any that contained *Gold, Nickel or Copper,* and Low reports that it is highly probable that no important deposits will be found in the basic rocks on that side of the bay.

The fisheries.—The fisheries of Hudson Bay will probably prove to be its greatest natural resource, as along the east-coast the sea is found well stocked everywhere with food fishes. In James Bay a net set at randon along the shore or about the islands always caught fish: these are usually sea-run brook trout and white fish identical with the Lake Superior white fish and being sea-run are, like the trout, much improved in flavour. These trout and white fish vary in weight from one to six pounds and are the best of food-fish. Similar fish are found abundantly along the entire coast to Cape Wolstenholme. The Arctic trout or Hearne salmon is found along the northern coast as far south as Seal River which is situated a few miles south of Cape Jones. This is a beautiful fish, with well flavoured, dark-pink flesh and it varies in weight from one to 15 pounds, the average being about five pounds. These fish are salted at Fort Chimo on Ungava bay and sold at nearly the same price in London as salted salmon from the same locality. They are very plentiful about all of the northern rivers and along the coast, while the Eskimos report them abundant at the Belcher and other islands lying off the east coast. There is no doubt that this fish equals or surpasses in colour and flavour the salmon of British Colombia. Cod are known to exist in Hudson Bay, being taken at Cape Smith and at Comb Hills in James Bay by members of the Low expedition. The Eskimos also catch them in Nastapoka Sound and at the Belcher Islands; at a number of places in James Bay they are also taken by the Indians.

The specimens of cod taken by Low were not very large but the men who caught them were Nova Scotia fishermen and they said that they were true cod and identical with those taken on the Grand Banks. Food for these fish is abundant in Hudson bay and there is no reason why extensive fisheries in this Canadian island sea should not exist. The undoubted presence of cod in Hudson bay deserves investigation, as a very valuable and exclusively Canadian fishery may be formed there. The presence of cod points to that of halibut in the deeper waters of the bay.

The only other salt-water foodfishes in Hudson bay are a couple of species of sculpin which are eaten extensively by the Eskimos. Sturgeon are caught in the lower parts of the southern rivers to the East Main river and lake trout occurs in the mouths and lower reaches of the northern rivers. The Atlantic salmon does not appear to enter Hudson bay, as no record could be obtained of its doing so from the Eskimos. Its range in the Arctic waters of Hudson strait seems to limit it to the rivers on the west side of Ungava bay. A curious coincidence in connection with this range of the salmon is that the ouananiche or land-locked salmon has never been found in Hudson bay, although common in the rivers of the northern, southern and eastern watersheds of Labrador.

White Whales.—The Hudson Bay Company formerly conducted successful fisheries of the White whale or white porpoise (Kellulauak, Eskimo) in the mouths of the Great and Little Whale rivers on the east side of Hudson Bay, but after some success the whales would not enter these rivers over the nets, and the fisheries were abandoned. Great numbers of white whales have been seen in the mouths of the rivers to the northward of Little Whale river, notably so in that of Nastapoka.

Whales.—The northern and eastern part of Fox Channel are still unexplored, and owing to the large masses of ice found there almost continuously, and to the numerous shoals and reefs in the known parts, it has never been a favorite place for whalers, its waters being the only portion of the bay where the whales have been left undisturbed. The whales are known to enter Hudson Strait early in the spring; they have been captured along Big Island in April and May, and at the western end of the strait in the latter part of May. They then crossed to the west side of the bay along the edge of the open water, being found in June and early July along the land-floe on both sides of the southern part of Roes Welcome. As the Welcome clears of ice they proceed north to Repulse Bay, and still later, pass through Frozen Strait into Fox Channel. Late in the autumn they again pass through Hudson Strait going eastward. By far the greater number of whales taken in Hudson Bay have been killed in the vicinity of Whale Point near the southern entrance to the Welcome.

Some whales are supposed to remain during the winter in the waters of Hudson Bay, as they have been reported by the Eskimos, as being seen in the depth of winter off Mansfield and some of the more southern islands of the east side of the bay.

The future of the whaling industry appears to be very gloomy. The annual catch is decreasing regularly, and only the high price of whalebone makes it at all profitable. No certainty of a single whale can be had, and the enterprise is reduced to almost a gambling chance. None of the whales now killed possess the precious whalebone. They are also of comparatively little value for oil, and when hunted by steamers in conjunction with shore factories, where all the products can be turned to profitable account, as is done in Norway and Newfoundland, and at Sept-Isles in the Gulf of St. Lawrence, can the chase for whales be made profitable. These whales include the Big Finner, which gives very little oil; the little Finner and the Humpback whale, whose whalebone is very short and a poor quality, and the blubber is poor and gives little oil. The very valuable Right or Greenland whale is practically extinct.

Future of Hudson Bay.—These undeveloped resources of the north will no doubt, when developed add greatly to the annual shipping of Hudson Bay, but the main increase to the fleet will be due to the products of the great plains of the North-West, now rapidly filling with robust settlers. These products of the western farms, grain, butter and cattle, will naturally seek the shortest road to the European markets; a road not only shorter, but owing to its cool climate, capable of landing perishable products and grain in a better condition than the more southern routes. Given a good harbour such as that of Churchill, and an adequate number of tramp steamships, there will be no difficulty in removing from that port during the season of safe navigation all the grain and other supplies that can be drawn there by a single line of rails.

HUDSON STRAITS

Hudson Strait, North Coast.—Dr. R. Bell visited the north shores of Hudson Strait in 1884 and 1885, and again in 1897, when he made a close examination of the coast from the neighbourhood of Big Island to Chorkbak inlet near Gordon bay. Dr. Bell describes the prevailing rocks of the southern shore of Baffin islands as consisting of well straitfield hornblende and mica-gneiss, mostly gray in colour, but sometimes reddish, intersteatified with great bands of crystalline limestones, parallel to one another and conformable to the strike of the gneiss, which in a general way may be said to be paralled to the coast in the above distance.

The northern shores of Hudson Strait along its western half although bold are not high, and the interior probably does not reach a general elevation of 1,000 feet. To the eastward of Big island the coast becomes higher, and the land rises slowly inland to elevations of 2,000 and 3,000 feet. The coast is not surveyed and is dangerous to shipping on account of the numerous shoals and rocky reefs that fringe it.

Dr. Bell in 1897 reported: "The whole coast is rugged and for the most part mountainous. The innermost islands interlock with the bays and points of the mainland in such a manner that it is impossible to know without the aid of a guide whether one has reached the main shore or not. So that the intervening channels cannot be seen, the eye fails to detect any difference between the general appearance of the islands and the mainland. The outer islands, which are also the smallest and most scattered, represent the more completely sunken hills, while as we proceed inward the progressingly larger and larger ones represent the less and less submerged areas and ranges, until, at last, we find only narrow channels of the sea running into the solid land. Besides these narrow and sometimes tortuous channels, numerous wide and tolerably straight fiords run inland. These generally have high hills on either side of them.

Hudson Strait, South Coast.—Ancient crystalline rocks occupy the entire coast-line from the mouth of the George river at Ungava Bay to Cape Wolstenholme at the western entrance of Hudson Strait. In passing westward from Ungava Bay the granite predominates along the coast, and the areas of the altered bedded rocks and their accompanying traps are much smaller, and are so intimately intruded by the granite that it is very difficult to separate them. Large masses of these basic rocks occur along the coast in several places between Cape Hopes Advance and Douglas harbour, most noticeably about Wakeham and Fisher bays, where quartz veins are numerous, and carry considerable quantities of sulphides.

Graphite.—Extensive bands, or veins, of this mineral were discovered by Mr. Caldwell to the south of Port Burwell along the east shore of Ungava bay. Graphite has also been found in the neighbourhood of Cape Wolstenholme, and along the east side of Baffin island, but no attempt has been made to develop any of the outcrops. Mr. Tremblay reports the existance of an abundance of graphite in the mountains on the northeast side of Tremblay sound, North Baffin Land. An attempt was made to mine graphite at the island of Blacklead in Cumberland gulf but the enterprise was soon abandoned.

Mica.—A Scotch whaling firm has worked a mica mine at Lake Harbour, on the south side of the Hudson Strait. A number of white men are brought to the place from Scotland in the early summer by the whaling steamer "Active"; and they, with the assistance of the Eskimos, work the mine, and then return home in the fall. In 1903, thirteen tons of excellent mica were taken out in this manner. A mica mine was opened some years ago on the west side of Cumberland gulf, but for some reason was shortly after abandoned. Low says: "Other deposits of this mineral will probably be found on that coast to the westward in association with the crystalline limestones so largely developed there."

Port Burwell.—Port Burwell, at the southern side of the eastern entrance to Hudson Strait, is an excellent habour, sheltered from all but the south-west winds, and, even with these, distant capes break the force of the wind and sea. The harbour lies on the western side of Gray strait; and about 15 miles from cape Chidley. It was originally discovered by Commander A. B. Gordon who erected one of the observation Stations there in 1885. The surrounding country, although low in comparison with that to the southward, is rugged, with steep rocky cliffs, that rise from 100 to 500 feet above the water of the harbour. There is little level ground in the neighborhood, and the trading post established there is situated in a small inside harbour, which can not be seen from the anchorage. In the outer harbour there are from eight to fifteen fathoms of water. The water rises 19 feet in spring tides, and 14½ feet in neap tides. It is the best sheltered harbour in the neighborhood, and it is also the easiest of access. With a light at the mouth of the entrance, there would be no difficulty for a stranger to find the harbour, and it would make a fine place of call for vessels going in or coming out. At present the eastern part of Ungava Bay has not been surveyed; it is studded with unknown islands, even the Button islands are more numerous than they are on the chart. It requires skillful navigation on account of the strong tide running in and out of the strait, the surroundings are very deep even close to the shores, a sharp lookout has to be constantly kept and the position very accurate. There is only one strait runnings out of Ungava Bay, to the ocean; it is called McLeLan Strait, in which a very strong current runs during the latter part of the tide. No vessels should attempt to go through this strait without the aid of a local pilot; as there is a rock about three-fourths of the way eastward, marked by a tide ripple, on which a vessel would be liable to touch, but there is sufficient room to pass on eithre side. The tide is very strong on the western entrance, but is more regular on the eastern side.

Moravian Mission.—In 1904 the Moravian Brothers bought from Messrs Job Brothers, of Newfoundland, their fishing and trading establishment at Port Burwell, where cod and seal are plentiful and a large trade in fur, skins and salmon is carried on with the Eskimos of Labrador .The Missionaries have built a church there, and in 1904 there were besides the members of the Moravian Mission, seventeen families of Eskimos living there, all of whom are devout Christians. The Eskimos on the Labrador coast in charge of the Moravian Mission, number about 1200 souls and derive their living from hunting and fishing seal, trout salmon, codfish, foxes, polar bears, wolves, martens, otters, minks, etc. The Moravian Mission has been established for more than 150 years, and the natives have all adopted Christian manners and customs. Two steamers from the Hudson Bay Company and two steamers of Revillon Bros of Paris call regularly at Port Burwell in the summer months and a mail reaches the Mission monthly, during the summer, by the coast of Labrador, and twice during the winter overland with dog sledges.

The south side of the mouth of Hudson Strait, during the season if ice, is much less embarrassed than the northern side; as a rule Port Burwell is free of ice early and late in the season.

Wakebam Bay.—Wakeham Bay is the safest and best harbour on the south coast of Hudson Strait. The coast rises abruptly from the shore and increases in altitude as Wakeham Bay is approached, where, on the east side of the entrance, a rounded hill rises 1800 feet directly from the water and must be a prominent mark from far to seaward; the other hills along this part of the coast vary in altitude from 800 to 1500 feet.

Wakeham Bay is 20 miles long at its mouth it is nearly 2½ miles wide, gradually narrowing to a little over a mile about 3 miles from the entrance. The water of the approach is deep, and the only obstruction to free navigation are two small islands, nearly covered at high tide, one of which lies about two miles north-east of the western head and the other three miles due north of the eastern side of the entrance. There is plenty of room between them, and they should not be dangerous when approaching the bay. The eastern side of the entrance is formed by a rocky peninsula 600 feet high, with a small lake in the middle. Beyond the narrows the bay averages 3 miles in width for 10 miles; the remainder of the upper end being less than a mile wide. A fine protected harbour out of the run of the tide and consequently free from the danger of quickly moving ice was found just inside the peninsula, with good anchorage in from 15 to 25 fathoms opposite the low sandy neck. There is no current in the cove and the ice pressure in winter is only from the wind.

UNGAVA BAY AND LABRADOR

Ungava Bay, West Coast.—Dr. Bell explored Ungava bay in a small yatch in August, 1897. He described Cape Hopes Advance as about 300 feet high and rising boldly out of the water, but south of it, the coast is much lower and irregular hills rarely exceed 200 feet in altitude. Thick fog appears to hang nearly constantly about Cape Hopes Advance, a circumstance caused by the warmer currents of water and air from Ungava Bay meeting the colder currents of the strait. But there was little fog inland. The bottom of the sea along the coast was covered with great quantities of kelp, and dredging produced three new small fishes, a sponge an anemone, a shrimp, some corals, and a few shells.

Shallow, rocky coast.—For about eleven miles south of the cape low rocky islands form a fringe about four miles wide along the coast. The water between the islands is very shallow, so that at low tide many of them are joined together and to the mainland. For the next twenty-eight miles the islands gradually die out, but the shallow water continues and the bottom being uneven is very dangerous on account of the great blocks and boulders scattered over it. The coast is low and broken only by detached irregular hills never over 200 feet high. The country is covered with drift to a considerable extent and the floats are dotted with many small ponds, the breeding place of ducks and wading birds. There are no large streams, the ponds being drained by a network of brooks. Great numbers of Eiders were seen nesting on the islands.

The appearance of the bay at this point at low-tide was startling. The bottom was entirely exposed for about three miles outside high-water mark and was formed of low rocky ridges with mud flats between them, while everywhere boulders of all sizes were strewn about. Sailing southward for another five miles they searched for upwards of an hour for sufficient depth of water to anchor in; and they finally found a hole between a number of small drift-covered islands with forty feet of water at high-tide. At half-tide the current between the islands was so strong that the yacht surged to and from and was in danger of breaking adrift, or dashing against the hummocks of boulders which formed the sides of the hole. Fortunately, as the tide became low the shallows about became dry and the current slackened, so that when the yacht grounded for upwards of an hour it was quiet water. This is an example of the great rise and fall of the tide in Ungava bay, and of the danger in navigating its shallow waters, where the tide falls an inch a minute, and where, in consequence, if a boat grounds in falling tide it is impossible to release her until the water rises again. On the Plover islands close by great flocks of these birds were met with, together with thousands of gulls, sea-pigeons and eider ducks. The coasts in the vicinity is low and flat like that previously described, and the shallow water extends several miles out from shore.

Payne Bay.—On August 15th they proceeded twenty miles further south, passing among the islands formed of rock and drift, separated from one another and from the low shores by shallow water, and arrived at a rocky headland called Tuvalik, on the north side of Payne Bay, where they found an Eskimo Encampment. They sailed up the bay, passing in shallow water over muddy flats and some time was spent examining the rocks of the mainland and islands, which were found to contain large quantities of iron-ore.

Payne River.—They then worked their way out of the bay (nearly dry at low tide) and afterwards ascended the Payne River, and anchored in thirteen fathoms of water six miles from its mouth. Next day, piloted by the Eskimos, they raced up stream, treble-reefed, ahead of a gale and made over 25 miles in less than three hours, where a bar of huge boulders, stretching diagonally across the stream, barred further progress. Caribou were plentiful in the hills, which rise about 600 feet above the stream and which are rough and rocky, consisting of granite mantled with clay up to an elevation of 300 feet. The climate seems to be less rigorous than along the coast, as the willows grow to bushes several feet high, instead of only rising an inch or two from the ground as on the sea-shore. Numbers of large trout were seen swimming in the eddies. Atlantic salmon were also abundant in the river.

Payne Bay.—Payne Bay is fourteen miles across at its entrance and gradually narrows to about three miles at the mouth of the river, which is eleven miles to the west ward of Tuvalik, and the bay is generally shallow and dotted with islands and bouldery shoals. There appear to be two deep channels leading from the mouth of the river towards the sea, one on either side of a group of five islands about three miles off the mouth. The deep water extends beyond the islands, but outside, in line with the capes, there appeared to be a number of low bars and shoals which practically block the entrance to the river for large vessels. The Eskimos said that far inland from the Payne River and southward the country is lower and flatter than the highlands of the coast, and that the extensive plains are dotted with lakes and covered with much better growth of vegetation, affording excellent feeding-ground for immense herds of caribou.

Low shores and shallow waters.—On August 20th, they sailed southward along a low flat coast, being gradually forced off shore by the shallowness of the water, which never exceeded five fathoms and at times less than three fathoms. For twenty miles they passed between a number of low rocky islands, lying from five to ten miles off the mainland. Eight miles further south the coast is rocky, having isolated hills 200 feet high, but generally low and flat. From here the course was south-south-east for seventeen miles to Cone island, only 140 feet high but very conspicuous among the surrounding low islands. They anchored in deep water behind some small islands six miles to the south-east of Cone island.

Hopes Advance Bay.—While looking for a harbour they entered this bay and found it very shallow. The mouth of the bay is blocked by large islands with shallow channels between them, through which the tides rush in and out with great violence, rendering the bay quite unnavigable for large ships. A river nearly as large as the Payne River is reported to flow into the head of Hopes Advance Bay. The next day they sailed through a labyrinth of islands which were named the Cyrfalcon Islands from the number of those birds seen. From the southern limit of the islands they crossed a bay called Leaf River Bay.

Leaf Lake.—Leaf River Bay is about eight miles wide at its mouth, but narrows to three miles across some ten miles up, where is the entrance to Leaf Lake, a body of salt water divided from the bay by a deep narrow strait walled in by rocky cliffs. The lake is about fifty miles long and ten miles wide, and the Leaf River flows in on the west side almost opposite the outlet, and is a considerable stream having a volume about equal to the Payne River. Salmon are not known to enter this river. Barren-ground caribou are always plentiful on the plains inland along the course of the stream, where willows and arctic birches grow abundantly as large bushes, and are the only tree of the region, the northern limit of spruce and larch being still further south. A small vessel called the "Fox" was sent annually by the Hudson's Bay Company from Fort Chimo to kill white porpoises in the lake.

Stony Point.—The south side of Leaf River Bay is totally different in character from the north shore being formed of granite rock; there is an absence of islands and the water is shallower gradually deepening to about five fathoms off shore. Stony Point is a rocky hill about 200 feet high, with a number of rocky knolls outside, which become islands at high-tide, with huge masses of rock scattered everywhere. The water is very shallow for two miles outside the point, and for five miles beyond the sea breaks upon a number of boulder shoals.

Coast north of Koksoak River.—From Stony Point the coast stretches for fifty-five miles along a low and almost unbroken shore to the mouth of the Koksoak or Ungava River. This part of the coast is low, with only three or four islands of shingle close to the shore and separated from the mainland by shallow channels dry at low-tide. This water deepens slowly to about five fathoms a mile off shore, and there appears to be very few shoals outside that limit except towards the mouth of the Koksoak river, where a number of rocky islands and shoals extend outwards from the north point for more than a mile. Other shallow places in the mouth of the river render an entrance hazardous without the aid of a pilot.

Fort Chimo.—The Hudson's Bay Company Post at Fort Chimo is thirty miles up the Koksoak river, and is the most northerly post of the Company in Labrador, being situated in latitude 50° 08'N. or just inside the tree limit. The fort is located on a low terrace on the south bank, facing a small cove and opposite the highest safe anchorage for sea-going ships. The post consists of about a dozen small buildings, the greater number of which are made from imported lumber as the trees of the region are too short and small to be of much use for building purposes. The permanent inhabitants are the usual officers and servants of such a post, and these with their Eskimos, wives and children numbered in 1896 about twenty-five persons in all.

Indian trade.—Trade is carried on with the Indians, who live along the tributaries of the Koksoak, and with the Eskimos along the coast of Ungava bay and Hudson strait as far west as Cape Wolstenholme. The total number of Indians trading at and dependent on Fort Chimo, is about 150. They belong to the Nascaupee tribe and speak a dialect of the Cree or Algonquin language. They are a poor, degraded people, without thrift or forethought, and as a rule, very lazy, being caribou hunters they can hardly be induced to trap fur-bearing animals. They depend wholly on the herds of barren-ground caribou for their food and clothing, and sell a certain number of caribou skins not required for their own use as food and clothing, with a few furs, to the Hudson's Bay Company for powder, shot, tea, sugar and tobacco, which comprise all their necessaries of life. Foxes both white and the varieties of the red species, form their principal fur hunt, but otters are also taken, and in early spring they make excursions southward into the wooded country for marten.

Eskimo trade.—The Eskimo trading at Fort Chimo are about 140 families, or 700 persons in all; but less than half of them visit the post, as the more northern families send in their furs by a few able bodied men who travel with dogs on the ice along the coast to and from the post in the spring. The Eskimo trade is chiefly in deer, seal, fox, white bear, wolf and wolverene skins, walrus ivory, seal and porpoise oil.

Fisheries.—The Company also engages in the salmon and porpoise fisheries along the lower Koksoak and in the Whale River to the south, and Leaf River to the northward. In 1896 the salmon fishery was poor, the catch being far below the average and only equal to half the catch of the previous year. The porpoise fishery is small and would be abandoned if it did not give employment to the Eskimos during the summer season.

Vegetation.—The trees in the valley below the Kaniapiskan are all small, and consist nearly exclusively of black spruce and larch, with only a few clumps of balsam poplar on the low sandy islands of the upper reaches. The trees cover the bottom lands and grow about half way up the hillsides about the Forks, but as the stream is descended they become smaller and are only found on the lower parts, and finally die out about fifteen miles above the mouth of the Koksoak river, the only remaining vegetation being small arctic willows, birches and shrubs.

Climate.—The climate of this region totally unfits it for agricultural purposes. At Fort Chimo, lettuce, radishes and a few small turnips are grown with a great deal of care and attention.

The rivers break up in the interior about the first week in June, but the ice does not leave the large lakes before the end of that month. The snow of the previous winter remains in all sheltered gullies fronting the north throughout July. During the day the temperature rises to 70° Farh., but the nights are always cold and severe frosts are common, throughout July and August; ice a quarter of an inch thick having been noted during the night of August 8th. Snow falls about the middle of September, and by the end of the month the ground is permanently covered, and the small ponds are frozen over; the rivers being closed by the middle of October. The following are the mean temperatures from three readings daily taken at 6 a. m., noon and 9 p. m.: July 50. 7F August 54. 1F.; September (1 to 11) 42. 8F.; Light rains and showers are frequent during the summer months, but the total rainfall is not great; during July and August rain fell on 40 days. The prevailing winds of summer are from west and north-west, and they are generally accompanied by clear weather, with passing showers.

Whale River.—The channel up to the post varies from a mile to a mile and a half in width and is full to the banks at high-tide, but at low-tide, bare mud-flats occupy over two-thirds of the width, with the deep channel considerably below their level. The post is situated at the head of navigation, there being shallow rapids only a short distance above it, where the influence of the tide ceases. The river has a volume about equal to the Payne River on the Gatineau River at Ottawa, and drains a large area of country to the southward, between the Koksoak and George Rivers. It rises in large lakes about 200 miles inland, on one of which the Hudson's Bay Company formerly had an outpost, mentioned as Erlandsen's Lake post in Mc Leans narrative entitled "Notes of a Twenty-five Years Service in the Hudson's Bay Territory", London 1849.

The banks of the Whale River are generally low, with terraced drifts behind and highlands in rear of post, where the hills rise about 500 feet and are partly wooded with small black spruce and larch, the woods extending nearly to the mouth of the river.

The post at Whale River is merely a fishing establishment and small trading station for the natives in the vicinity, consisting of three small buildings. The salmon fishery in the lower part of the river was formerly a paying industry, but has been gradually decreasing and in 1897 was almost a total failure, as were the fisheries in the Koksoak and George rivers.

Coast between Koksoak and Whale Rivers.—The coast between the mouths of the Kodsoak and Whale Rivers is generally low, with a range of hills extending from the mouth of the former, stream south-east about the head of False River Bay (so called on account of having been often mistaken for the mouth of the Koksoak) to the mouth of the Whale River. False River Bay is several miles long and about three miles wide at its mouth, but is so shallow that it cannot be navigated even by small craft.

A line of reefs, bare at low tide, extends northward from the islands at the mouth of Whale River to end beyond a large island called Saiglorsoak, that lies sixteen miles outside. This island is surrounded by a cluster of smaller ones, all high and rocky and forming good marks in steering for Koksoak River. Saiglorsoak is about five miles long and should be kept well to the southward as the reefs continue some miles beyond it.

Coast East of Whale River.—The coast east of the Whale River is generally low with an occasional rocky point. The water is very shallow everywhere for two or three miles off shore. There are a few rocky islands scattered along the shore, but they are surrounded by water too shallow to afford harbours between them. There are two long bays extending inland, but they are very shallow and nearly dry at low-tide and quite unapproachable. The margin of low land varies from one to five miles in width; beyond it the country consists of rocky hills rising from 500 to 1000 feet, the hills are broken by deep river valleys and minor streams.

George River.—The George River is a large stream, second only to the Koksoak; it drains a wide area of country to the southward, extending from the western slopes of the Atlantic range to the Whale and Koksoak drainage-areas on the west. It rises in large lakes of Central Labrador, in the vicinity of the fifty-fifth parallel of north latitude, close to the headwaters of the North-west and Hamilton rivers which flow eastward into Hamilton Inlet. Beacon island is the largest of the group lying off the western point at the mouth of the river, and is situated about two miles from Gull island, which is connected with the shore at low-tide. The width of the main channel is three miles at the mouth. The Hudson Bay post is situated in a cove on the east side of the river twenty-three miles from Beacon island. The post consists of the usual three or four small houses built on the side of a hill that rises sbout 700 feet above it. The opposite side of the cove is bounced by a similar hill, and the situation is very desolate especially at low-tide when the bottom of slimy mud and boulders is bare out to the river a mile away. A few stunted trees grow along the banks of a large brook which flows into the upper part of the cove. The post is kept up chiefly for the salmon fishery and for the trade with about 20 families of Eskimos living along the eastern shore of Ungava Bay. All the goods are landed with boats at the post more than a mile away, and as this can only be done when the tide is more than half in, the ship always tries to be at George River near the time of highest tides. There is a great difference in the appearance of the river at high and low-tide. When the tide is high the water reaches to the foot of the bold rocky shores generally without a beach, while at low-water a wide-margin of boulder-strewn mud intervenes between the channel and the rocky banks. The hills about the mouth of the river range from 100 to 400 feet in height. As the river is ascended there is a gradual increase in the general elevation, so that above the narrows the hills are from 500 to 1,000 feet high, and the general level of the country is close on 500 feet. Small spruce trees are first seen a short distance above the eastern end bond, and the forest becomes quite thick and continuous in the river valley about ten miles above the post. The influence of the tide extends to a rapid some ten miles beyond the post, and above it the river varies from a quarter of a mile to a mile in width and is very swift, flowing in a shallow channel with nearly continuous rapids but no actual falls. It is navigable with boats for about forty miles above the post.

Iron ores.—"Mention has been made" writes Low, "of the iron ores on the west shores of Ungava bay, on the north side of the Payne river. The rocks in which these ores are found have been altered by the intrusion of granites. They now consist of quartzites, mica-hornblende schist and crystalline limestone, and are the metamorphic representatives of the unaltered iron-bearing rocks of the interior of Labrador peninsula and the east coast of Hudson bay. In localities where the rocks are unaltered the iron ores occur either as carbonates in a cherty rock, or as a mixture of magnetite and haemetite intimately associated with chert and jaspar. At Payne river the iron-bearing beds have a thickness of 420 feet. The upper 70 feet is a light-yellow fine granular quartzite containing patches of ankerite and lime. Towards the top the rock shades to a dark bluish-gray, from the presence of large quantities of magnetite in small flattened grains, together with small scales of specular iron. These are usually mixed with-quartz with evidence of foliation, and at other places are in large masses of nearly pure ore. Underlying these beds is 350 feet of dark-bluish slaty quartzite holding considerable magnetite and haematite, and shading upwards into a barren quartzite. Most of the ore of this locality would probably require separation and concentration from the admixed quartz before being of a grade sufficiently high for smelting. The position of the deposits on the west side of Ungava bay, where the tide rises and falls forty feet or more, is not very promising for shipping."

Labrador.—Labrador will probably never support a large population, for the climate is not conducive to the production of crops and the land is very rocky and for the most part mountainous; but there is wealth to be developed in its minerals and from its forests and fisheries; and there are great cataracts and water-powers there that will, when harnessed generate almost unlimited electric powers. One of them is the Grand Falls on the Hamilton river, one of the great water-falls of the world, and it is to be harnessed, according to recent reports, for the production of nitrogen. A concession has been granted by the government to a company and it is estimated that a million horse-power can be secured. In this case nitrates will soon be coming from Labrador to fertilize the almost exhausted soil of sections of the earth that have been thickly populated for centuries, and when further improvements are made in the electric smelting of ores, the enormous water-powers will doubtless be applied to reducing the immense deposits of iron-ores in Hudson Bay.

Baffins Islands

The territory now known as Baffin Land, until about 1875, was supposed to consist of different islands known as Cockburn Islands, Cumberland Islands, Baffin Land, Sussex Islands, Fox

Land, etc. It is now established that these are all connected and that there is but one great island, comprising them all, to which the name of Baffin Land has been given. It forms the northern side of Hudson Strait, its southern extremity being in Lat. 61º 42′N., opposite Cape Chidley, and it extends in a northwesterly direction to latitude 74o ′N., on Lancaster Strait. It has a lenght of about 1,005 English statute miles with an average breadth of 305 miles, its greatest width being 500 and its least 150 miles. Its area approximates 300,000 square miles, and it therefore comprises about one tenth of the whole Dominion of Canada. It is the third largest island in the world, being exceeded only by Australia and Greenland. It was until recently, called Cockburn land although it had been named Baffins Island or Baffin Land by Lieutenant (afterwards Admiral) W. E. Parry in 1821, out of respect to the memory of that able and enterprising navigator".

Grinnell Glacier.—The southern extremity of the island, is covered by the Grinnell Glacier, between 70 and 100 miles in length from southeast to nortwest, between Lat 62º and 63º, with a breadth of about 20 miles. The smooth summit of the glacier is distinctly visible from vessels in Hudson Strait in certain conditions of the weather. One narrow stream of ice is said to reach the waters of the strait. The existing charts represent the northern side of the glacier sending ice down at two or three places into the head of the Frobisher Bay. The Eskimos called the Grinnell Glacier, Ow-u-i-to, and the Eskimo guide of Dr. Bell knew of only one place, called Pak-a-lui-a, where it discharged into the sea, not far from the north-west of Resolution island. There are no glaciers discharging into Fox Channel or Hudson Bay.

East Coast.—The eastern coast of Baffin Island is generally high and rocky and has never been accurately surveyed and charted. The land rises quickly from the sea, often in abrupt cliffs, to elevations of a 1000 feet or more, after which the upward slope, is more gentle as the land rises towards the interior table land. The general elevation of the table land, to the south of Cumberland Gulf, ranges from 2000 to 3000 feet, while to the northward this wide coasted area is much higher, reaching a general elevation of 5000 feet, with hills rising above that perhaps one ot two thousand feet higher. Inland, to the south of Ponds Inlet, the general elevation does not appear to exceed 3000 feet, and to the westward along Fox Channel, is considerably lower.

The western side of Baffin island is as yet unexplored, and all information concerning it has been obtained from the Eskimos. They describe the coast as generally low, and much the same in character as that of the limestone islands of Hudson Bay. The crystalline rocks appear to form the south-west coast of Baffin land for some distance beyond King Cape on the east side of Fox Channel, when they give place to a wide area of low lands extending nearly to the head of Fox Channel, where the crystalline rocks again form the higher lands to the north and east of Fury and Hecla Strait.

The western interior of the northern half of Baffin Land, which is known on the chart as Cockburn Land, is described by the Eskimos as a rough plain, probably less than 1000 feet in elevation diversified by rolling hills with numerous lakes in the valleys between. This country is well covered with an Arctic vegetation which provides food for large bands of barren ground caribou. There are no musk-oxen in Baffin Land there are two large lakes in the lower country of the south-western part of the island, called Nettilling and Amadjuak; both are upwards of a hundred miles long, and are said by the natives to abound in salmon and fresh-water seal. A short rapid stream connects these two lakes, and Lake Nettilling connects with Fox Channel by a wide stream, called the Koukdjuak about 60 miles in length that is said by the Eskimos to be capable of being navigated by vessels of shallow draught.

The natives told Dr. Boaz that this river was a very large stream with numerous rapids. Old Peter, a Cumberland Sound native, living at Ponds Inlet told us that the upper part had little current while in the lower part the current was more rapid. The average descent is probably 5 or 6 feet per mile. Lake Nettilling or Kennedy is about 250 feet above sea-level and about 150 miles long and 60 miles wide. Lake Amadjuak is about 120 miles long by 40 in breadth and 290 feet above the sea-level. It connects with Lake Mingo to the south by a small stream, with a moderate current, up and down which the natives paddle their Kayaks. Lake Mingo is 300 feet above sea-level and fifteen miles in diameter and connects by a series of small lakes and streams with Amadjuak Bay on the north coast of Hudson Strait.

Dr. Robert Bell of the Canadian Geological Survey visited Amadjuak Bay in a small yacht in July 1897 and travelled north to lake Amadjuak, a distance of 50 miles in seven days. The soil consisted of till and dry heaps and ridges of sand and gravel without boulders or even large stones. The till was present in the bottoms of valleys and partook of a gravelly and sandy nature rather than of clay. Most of the way was along the bottoms and sides of valleys, the course being crossed frequently by riverlets of transparent ice-water.

No trees.—The rocks of Baffin island are principally Laurentian, and the climate is sub-arctic and the soil, in common with the rest of the Arctic islands is destitute of trees, and agriculture is impossible.

Game plentiful.—In lake Amadjuak icebergs have been seen floating in its waters, which have broken off from glaciers on the eastern and southern mountains which enclose the lake. The natives from Cumberland Gulf, Frobisher Bay and the north shores of Hudson Strait resort to the shores of these lakes annually to slaughter large numbers of barren ground caribou, which are found in large bands on their favorite feeding grounds in the low lands that encompass the lakes to the north and west. At the mouth of the large Koukdjuak river that flows from lake Nettilling into Fox Channel about Lat 66° 30′N., and just within the Arctic Circle, the sea-shore is sandy and the waters of the long bay are shallow with a sandy bottom, covered with clams and other sea-shells on which walrus and seal feed in large numbers. Ptarmigans and Arctic hares and large flocks of migratory birds are also found there, and Polar bears along the high mountains shore to the south of Cape Dorchester.

South shore, Baffin land.—The northern shores of Hudson strait along its western-half, although bold are not high, and the interior does not reach a general elevation of 1000 feet. To the eastward of Big island the coast becomes higher, and the land rises slowly inland to elevations of 2000 to 3000 feet.

Direction of Ranges.—The mountains of Baffin Land may be grouped as three principal ranges, all running north-north-westerly nearly parallel to the eastern side of the island and the western coast of Greenland, the north-eastern or outmost range being the highest and the south-western the lowest.

Elevation of the High Lands.—According to Dr. Franz Boas, the high interior of Baffin Land, lying just north of Cumberland Sound, is apparently all covered with ice like the interior of Greenland. Around the margins of this ice-cap the general elevation above the sea is about 5000 feet, and it rises to about 8000 feet in the central parts. Another area of smaller extent, but apparently equal by high, lies a short distance to the north-west of the one just described. The high land, mostly ice-covered, lying north-east of Cumberland Sound and stretching over to Exeter Sound, is probably at least 5000 feet high. Large portions of the northern interior are over 1000 feet above the sea, often nearer 2000 feet, while the higher parts of these areas may be 2000 or more. The mountain region between Frobisher Bay and Cumberland Sound appears to have an elevation of between 2000 to 3000 feet.

Graphite.—Graphite is found abundant and pure in several islands situated on the 65th, parallel of atitude, in Cumberland gulf, and on the west side of Davis Strait. At Cape Durban, on the 67th. parallel, coal has been found by the whalers. Coal also is found at Salmon River on the South shore of Eclipse Sound.

C. F. Hall brought home a considerable collection of rocks and minerals picked up during his explorations about Frobisher bay and the southeast coast of Baffin island. These were named by Prof. B. K. Emerson, and consist of ordinary Laurentian rocks, including granite, gneis and schists. The minerals were magnetite, apatite, bornite and pyrite from Frobisher and Cyrus Field bays.

Silliman's Fossil Mount.—Lower Silurian limestones were found in a small outlier at Silliman's Fossil Mount near the head of Frobisher bay. This locality was visited in 1897 by a party from the Peary Arctic Expedition of that year. In the course of a few hours they obtained 54 species of fossils from this locality, which were later named by C. Schuchert of the United States National Museum. The only known occurence of Silurian limestone on the eastern side of Baffin island is at Silliman's Fossil Mount, near the head of Frobisher bay, where the limestone forms a hill 1000 yards long and 350 feet high, resting almost flat upon the crystalline rocks. Seventy-two species were identfiied by Schuchert from fossils brought back from this locality; and 28 of these are not known to occur elsewhere. The majority of all the species or 57 per cent, correspond with those of the Calena or Trenton formation of the Minnesota and Manitoba region, while 17 are known to occur in the Trenton of the Ottawa valley and the State of New York. About 20 of the species are now to palaeontology and most of these are described and figured in Prof. Schuchert's paper. He adds: "The lithological similarities of the Minnesota Calena and Silliman's Fossil Mount, light-colored shales predominating in both areas, may explain in a large measure the close identity of these widely separated faunas. The little fauna likewise brings out the fact that the corals, brachiopods, gasteropods and the trilobites are slow in their evolutional change, and the species can therefore spread over very large areas while the cephalods, and particularly the pelecypods, are more sensitive to change and are thus restricted to localities... The Baffin Land fauna had an early introduction of Upper Silurian genera in the corals, Halysites, Lyellia and Plasmopora. In Manitoba similar conditions occur in the presence of Halysites, Favosites and Diphyphyllum. Other Upper Silurian types do not appear to be present".

Southampton Island

Southampton Island.—Southampton Island is situated in the notrhern part of Hudson Bay, which it divides into Fox Channel on its east-side and Roes Welcome on the west, and is separated from the mainland at its northern end by the narrow Frozen Strait. The island covers three degrees of latitude or 210 miles from north to south and is 200 miles wide at its grestest breadth. It is triangular in shape and has an area of 19,000 square miles. The greater part of the island is composed of flat-bedded limestone, causing the southern and western shores to be generally low and flat, with a margin of shallow water extending several miles from the land. Along the eastern side a land of crystalline gneisses, schists, and granites entends from Seashore Point to the north end of the island, and this forms much high land with bolder water adjoining than is found elsewhere. The rocks near the junction of the Archaean with the Silurian limestones at Seahorse are largely a very quartzose, light grey mica-gneiss holding graphite in small flakes, the rusty colour being due to the decomposition of small grains of pyrite disseminated through the rock. This gneiss appears to be similar to the sillimanite gneis of the Grenville series of Southern Canada. The gneiss is cut and twisted by masses of a coarser granite-gneis pink to red in colour, with nearly feldspar and smoky quartz, all are cut by dikes of feldspathic pegmatite containing much of the pearly feldspar. Flat lying beds of light coloured yellow and drab limestone occupy the lowlands and western parts of Southampton Island. Fossils from the beds forming the southern half of the west coast of the island containing a fauna closely resembling that of the Lake Winnipeg basin and extend over a period from the Cambro-Silurian. to high up in the Silurian.

Game abundant.—The western shores of Southampton are low. The land behind rises in a succession of ridges each a few feet higher than the one immediately in front. These ridges are formed of broken limestone. Very little vegetation grows on the ridges, but in the wide depressions between them there is a profusion of grasses and other arctic plants on the waste ground surrounding the many ponds and lakes found there. The shores and islands of these lakes are the breeding grounds of a number of rare birds, among which may be mentioned Sabine's Gull, Arctic Tern, Whistling Swan, Hutchen's Goose, Snow Goose, Jager, Little Blue Crane, and Red Phalarope. Caribou are plentiful in the interior and are, according to the Eskimos, very fat in the summer time. Walrus abound in great numbers in Roes Welcome and along the northern coast.

Dangerous Coast.—The water in Roes Welcome is usually very shallow for 2 or 3 miles from the land, and reefs of limestone extend much farther out. About Cape Kendall dangerous reefs are found at least eight miles from the land.

Formation.—Low writes: "Sealhorse point is the junction of the granite and gneisses with the Silurian limestones. There is here a marked difference between the southern limestone area and the northern country, underlain by crystalline rocks, with its typical long, low rounded hills, lying in roughly parallel ridges, and separated by wide shallow valleys dotted with lakes and ponds, or filled with coarse boulder clay, with boulders scattered in profusion everywhere. This land, although high by contrast with the limestone country, seldom reaches an elevation of 500 feet, and that only far inland, there is one conspicuous peak, which rises like a great sugar loaf, far inland, its snow-capped summit of the lightest-blue."

The limestone country.—"The limestone country occupies all the southern part of this great island, and also underlies the large islands of Coasts and Mansfield farther to the south. The same physical characteristics prevail wherever the limestone is found. The low shores are bounded by gradually deepening water, broken by dangerous reefs that extend several miles from the land. The country rises very slowly inland, from the shores, in a succession of low, broad terraces, each a few feet higher than the one in front. These terraces are covered to a depth of several feet by broken limestone, which affords perfect drainage, and in consequence the surface is so dry that it will not even support a covering of the hardy Arctic plants. This absence of vegetation leaves the monotonous light-yellow shingle quite unrelieved by any dash of other colour, and the general view is one of dry desolation, much worse than that of the hilly country. The limestone region never reaches an elevation of one hundred feet than walking distance of the shore."

North-West Coast – Hudson Bay

North-west Coast.—The rocks seen along the shore between Chesterfield and Winchester inlets are largely a flesh-red to pink mica-hornblende granite gneiss. These are associated with broken bands of dark-gray or red gneisses, usually very quartzoes and containing a considerable quantity of mica and hornblende, the latter often partly decomposed to chlorite. These gneisses have evidently been cut and broken by the intrusion of the granite-gneisses. Many veins of pegmatite cut all these rocks; it consists chiefly or red or violet feldspar with much quartz and in some places large crystals of black hornblende. The granite-gneisses are also most abundant inland, as was seen by Low along the lower part of Chesterfield inlet and in the country forty miles inland from Winchester inlet.

The granites occupy the shores and islands between Winchester inlet and the west side of Island bay, about half way to Fullerton, when they give place abruptly to a series of dark schists. These schists are largely micaceous, out there are also frequent bands containing considerable quantities of hornblende, and these are more basic than the more common mica-schists, which always contain quartz in varying amounts. Many of the basic bands contain varying quantities of pyrite, but it was never seen in sufficient abundance to constitute a mine. All the schists carry dark-red garnets, some of which are regular in their crystallisation and of good size.

Fullerton Harbour.—The islands about Fullerton harbour are formed partly of granite and partly of these dark schists. Areas of coarser rocks now occur in the rocks along the coast, usually in the form of coarse gabbro, but often in a more altered condition as coarse hornblende-gneisses. The granite are the prevailing rocks along the coast as far north as the mouth of Wager inlet and have generally a red or pink colour. Associated with them and evidently altered by their intrusion are patches of gray quartzose, gneiss, and less frequently areas of old basic intrusive rocks.

Wager Inlet.—The explorations for minerals by Dr. Rae ended at Repulse Bay which was discovered first in 1742 by Captain Middleton who was sent by the British Admiralty to look for a north-west passage. Capt Middleton also discovered Wager Bay in the same voyage. All the geological informations concerning the western coast of Hudson Bay to the northward of Wager inlet is contained in the narratives of the voyages of Parry and Dr. Rae. The latter reported only Laurentian rocks along the coast, with granite-gneiss predominating, these being accompanied by considerable areas of greenstones, showing the rocks in the northern part to be very like those along the southern shores of Roe's Welcome. The granites prevail about Wager Inlet, but there are more and larger areas of the dark basic rocks about that great bay than to the southward, especially as these basic rocks generally carry sulphides and Rae reported free gold to have been found about the head of the inlet. Mr G. F. Caldwell, who accompanied Mr. Low's expedition in 1903-04 made a sledge journey to the head of Wager Inlet and also found traces of gold in the rocks of that region.

The entrance to Wager Inlet is very narrow and full of dangerous whirlpools owing to the swift tides which rush through it and which do not freeze over in winter. The native village of Aivillig lies about 20 miles north or the entrance opposite some small islands in Roe's Welcome, where whales and walrus are plentiful.

Fox Channel.—Fox Basin lies in the middle of a very extensive flat through of horizantal limestone, surrounded in a general way on all sides by high Laurentian hills. The Spicer islands in the centre, in latitude 68° North, are composed of light-gray quartzose gneis, some of it holding purple garnets.

'West Coast - Hudson Bay

Character of Coast.—The western coast of Hudson bay is low and flat. It rises very slowly from swampy shores, while the waters deepen slowly, and there are numerous shoals and bars that extend for a considerable distance from the shore-line and render coastwise navigation dangerous. This character of coast extends from the southern end of James Bay to beyond the mouth of the Churchill harbour. Further north the character of the coast changes semowhat, being still low, but much more uneven in outlines, with a corresponding unevenness in the sea-bottom. Beyond Eskimo point, in 61° N. latitude, the straight shore of the southward gives place to a ragged coast-line, broken by large bays, and fringed with rocky islands having shallow water between them, and a broken bottom very dangerous to navigation. On this account, and because of the danger of outlying shoals, and strong currents, the navigation of Chesterfield inlet and that of the other northwestern bays and harbours is debarred from consideration from a commercial and shipping point.

The mouths of all the large rivers to the southward of Churchill are more or less blocked by deposits of sand and clay with bars or flat shoals with river deposits at their mouths. Only small craft can enter these rivers and larger ships are obliged to lie outside in the dangerous roadsteads usually several miles from the nearest dry land.

Huronian rocks.—Tyrrell reports that on his journey southward from Chesterfield inlet to Port Churchill he found Huronian rocks occupying the west shore of Hudson Bay for a distance of nearly a 100 miles. At haphazard landings along this shores traces of copper deposits were found in a number of places, and systemathic search would probably lead to important discoveries in this area.

Copper deposits.—Of these deposits Tyrrell reports as follows: "At a point northeast of Rabbit island the character of the shores changes, and dark-green Huronian schists crop out from beneath the boulders.

Mispickel diabase.—"North of Rabbit island is a high point, on which the Eskimos are accustomed to camp while waiting for the traders from Churchill. The point is composed of green calcareous, chloritic schist, striking south 55° W., at an angle of 60° The schist is cut by a dike 75 feet wide, of massive green, highly altered diabase, containing a large amount of mispickel. This diabase also outcrops along the shore, where it encloses many bands of schists.

Quartz, calcite and copper pyrites.—"The rock at the Point south of Corbett inlet is a massive green, fine or medium grain diabase, which is now altered almost entirely into a mass of chlorite, espidote, zoisite, and calcite. This diabase is out by many small veins of quartz and calcite, holding copper pyrites arsenopyrite and chalcopyrite.

"On the northern shore of Mistake Bay, nine miles west of Term point, is a long point of similar diabase. Seven miles further southwest, about the middle of the west shore of Mistake bay, is a similar point of similar dark-green diabase, containing in many places large amount of copper pyrites, and cut by small veins of quartz studded with iron pyrites.

Two miles south of Sir Bibby island is a prominent rocky point with a high rocky island, lying a short distance off it. From this prominent point the shore turns westward, and is bold and rocky being composed of dark-green diabase, studded with copper pyrites.

Churchill to Cape Esquimaux.—The coast between Churchill and Cape Esquimaux is described by Tyrrell as follows: "On the low flat shores of Hudson Bay between Seal river and Cape Esquimaux few rock exposures occur, but those seen consisted of granites and gneiss of typical Laurentian aspect. For forty miles north of Cape Esquimaux no rock in place was seen, and thence northward to Baird bay some of the points consisted of granite and gneiss, though the shore generally consisted of Huronian rocks".

Marble Island, Quartzites.—Marble island is composed of hard white quartzite, which is composed of more or less rounded grains of quartz, of moderately regular size cemented together with interstitial silica. These quartzites, says Tyrrell, are very distinctly bedded in thick or thin beds, and the surfaces of the beds also often show distinct false-bedding. These quartzites are probably the base of the Huronian rocks on the mainland. Tyrrell thinks that it is not improbable that this Marble island quartzite is the oldest part of the Huronian in the region near the shore of the west coast of Hudson Bay.

Inland.—On the west coast of Hudson Bay Tyrrell, when descending the Doobawnt or Telzoa River in 1893, came across the last grove of black spruce a few miles south of Doobawnt Lake in Lat. 63º N., where the trees were so stunted they were not head high. In the river at this point, opposite the grove, he caught some fine salmon-trout and white fish, the former weighing as much as ten and a half, and the latter as much as 8½ lbs. The banks of the river, of red till and boulders, were low and sloping and rose to a wide grassy plain, on which large herds of barren-ground caribou were grazing. One vast herd estimated to contain 200,000 deer was seen on the shore of Carey Lake. These deer were migrating southward toward the edge of the woods, where they would spent the winter.

Tyrrell made the following entry in his journal: "After paddling up Carey Lake for five miles, directing our course to a high point with a large boulder on its summit, afterwards called Cairn Point we saw an immense herd of caribou (Rangifer Groenlandicus), moving along the east shore. We at once paddled towards the land, and found the deer standing on low wet grassy land near the water, at the foot of a long stony slope. Here were deer in abundance, and near at hand was a grove of small black spruce and tamarack, which would furnish fuel to smoke and dry as much meat as we could carry, July 30. Yesterday was the best clear warm day that we had had for a long time, but to-day is also clear and warm, with a gentle breeze blowing from the west. We spent the day skinning and cutting up the fattest of the bucks that we had killed yesterday. Our camp is a hundred yards from the lake, near the edge of a bog, with a scattered grove of larch and small black spruce, just behind us. All day the caribou have been around us in vast numbers, many thousands being collected together in single herds. One herd collected on the hill behind our camp, and another remained for four hours in the wet bog on the point in front of us. The little fawns were running about everywhere, often coming up to within a yard or two of us, ultering their sharp grunts as they stood and looked up at us, or as they turned and ran back to the does. About noon a large herd had collected on the sides and summit of the hill behind us. Taking the small hand-camera with which we were supplied, we walked quietly among them. As we approached to within a few yards of the dense herd, it opened to let us in and then formed a circle round us, so that we were able to stand for a couple of hours and watch the deer as they stood in the light breeze, or rubbed slowly past each other to keep off the black flies. The bucks, with their beautiful branching antlers, kept well to the back ground. We obtained a number of protographs, which show the animals in many positions. Later in the afternoon a herd of bucks trotted up to us, and stood at about forty yards distance. This was a most beautiful sight, for their horns are now full-grown, though still soft at the tips, but unfortunately we had not the camera with us. We did not shoot any to-day. Ptarmigan are very plentiful in the vicinity.

Animals.—Musk-oxen seemed to be confined to the country lying between the Doobawnt river, north of Doobawnt Lake and the west shore of Hudson Bay, Red, black and cross foxes range as far north as the northern limit of timber. Arctic foxes, wolves, gray and white, wolverenes range the Barren Lands. Marten are particularly abundant in the southern part of the region. Otter are also found in the wooded country. Black bears are seen in the woods and Polar bears on the northern shore. Arctic hares were found scattered over the Barren Lands. Moose were found as far north as the Stone River. Water birds were scarce in the interior, back from the shore. The Canada and Ruffed Prouse were fairly numerous in the wooded country. The Willow and Rock Ptarmigan were abundant in the summer time throughout the Barren Lands.

Fishes—Fish seemed to be everywhere abundant in the lakes and streams. Lake trout and whitefish were the more abundant and valuable foodfishes; the latter being especially abundant in Doobawnt lake, Pike and a species of sucker were seen. Tyrrell considers it probable that some of the true salmon ascend the streams of Northern Hudson Bay, although none were seen. Chippewyan Indians inhabit the woods and inland Eskimos camp along the northern banks of the Telzoa and Kazan rivers.

Chesterfield Inlet.—Tyrrell explored Baker Lake and Chesterfield Inlet in 1893 and gives the following description of the latter: "On the evening of September 6th we entered the northern outlet of Baker Lake, down which the water was flowing towards us. For a moment it seemed as if we must have taken the wrong course, but we soon recognized that we had met the incoming tide, though the water was quite fresh. The tide therefore appears to ascend as far as Baker Lake, though it does not appreciably affect the level of the lake itself." These falls, mentioned by Turrell, at the junction of Chesterfield Inlet and Baker Lake are reversible and flow in opposite directions as the tide rises and falls.

"Chesterfield Inlet is a long, narrow fiord extending 125 miles westward from the north-west coast of Hudson Bay. Including Baker Lake it has a total length of 210 miles. On each side are bare, rocky slopes usually from 100 to 200 feet high. No soundings were taken by the writer, but the greatest depth marked on Captain Christopher's chart made in 1762, is forty fathoms. At its upper end, just east of Bowell island, the tide was found to rise six feet, while at its mouth the rise of the spring tide is about eighteen feet. At the rocky point southeast of Spurrell Harbour which is at the southern entrance to Chesterfield Inlet we found the latitude to be 62° 20′ 10″, and the variation of the compass 10° W″.

The country round Chesterfield Inlet consists of utterly sterile rocky hills of coarse red granite or light-gray gneiss, often cut by veins of coarse pegmatite, mica-schist, coarse white granite and narrow dykes of dark greenstone.

Loudon Rapids.—About twenty miles south of where the Doobawnt River enters Lake Aberdeen, in latitude 64°, 27′ 12, a narrow dyke of green diabase crosses the river, forming a heavy rapid, here called Loudon Rapid, after the President of Toronto University. The diabase dyke cuts through a coarse red massive andesite composed of a fine-grained micro-felsitic groundmass, coloured by a number of rods and granules of iron ore, in which are imbedded large phenocrysts of plagioclase, very much decomposed. There are also a few crystals of light-green chlorite, with dark borders of magnitite, and a few scattered crystal of apatite. The rock is very much jointed, and breaks easily when struck. Along the jointage planes it is often considerably decomposed, with the formation of a green-crust of copper-carbonate".

Wharton Lake.—About a mile and a quarter above Wharton Lake Tyrrell found that the Telzoa or Doobawnt river flowed very swifth over a ten-foot fall over a ledge of massive red and green epidolic quartz-chorite which contained large crystals of plagioclase, with smaller intermediate grins of quartz and plagioclase, biolite altered to chlorite, hornblende, epidote, apatite, and iron ore altered to lencoxene. The western shore of the lake is a grassy slope, rising to a terrace thirty feet above the water, or to rounded grassy hills sixty feet high. From the foot of the slope long points of boulders and masses of red quartz-porphyry and mottled red-sandstone run out into the water, and the shores and hills are also largely composed of loose masses of red quartz-porphyry. The whole character of the country suggests a morainic area Laurentian gneiss appears at the north-west angle of the Lake, behind a long island, and on the point just north of the outlet of the lake is a rounded hill 230 feet high of white Huronian quartzite, seamed by narrow veins of white chalcedonic quartz.

Canot Cassé Rapid.—Nine miles below Lake Marjorie and two miles below Canot Cassé Rapid is a hill, 200 feet in height, composed of mottled, light-greenish, coarse diabase, made up of large interlocking lath-shaped crystals of plagioclase, between which is angite, largely altered to a light-green hornblende. With these are crystals of apatite and a number of particles of copper-pyrites.

Angikuni Lake.—Tyrrell reports the existence of a small island in Angikuni Lake on the Kazan River in latitude 62°, 20′N., which is composed of highly ferruginous schist much reddened by oxidation which could not be examined as it was held sacred by the numerous Eskimos camped in that vicinity. Another small island close by was found to be composed of dark medium-grained diabase, containing much pyrite, cut by many veins of white quartz. In the vicinity is a fine-grained dark mica-schist, through which the diabase is probably intruded.

Where the Hazan river leaves lake Angikuni, Tyrrell writes: "It first spreads out over a wide bed of boulders, becoming very shallow, and then contracts to seventy yards in width, and rushes as a deep rapid and almost straight stream, between banks which rise in gentle slopes from the edge of the water. These slopes are covered with grass and low willows. Many caribou were lazily lying down or feeding among the bushes and turning their heads, they looked in quiet wonder as the strange apparition of the two canoes that had penetrated the centre of their northern home. The whole landscape seen in the early morning light presented such a picture of wild but quiet beauty, as I have seldom had the good fortune to enjoy."

Port Churchill.—The approach to the harbour of Churchill, if aided by a few beacons and lights, would be comparatively safe, as the channel of approach is fairly deep and wide. Once inside the points of the mouth, the harbour extends up stream about a mile, and has an average width of half a mile, with a couple of shallow places in the upper part that might easily be removed by dredging; the general depth of the harbour being from 4 to 4½ fathoms.

For many years the Hudson Bay sailing ships and steamers have sailed to Churchill, anchoring behind the beacon light; for Churchill possesses an excellent natural harbour, deep and well sheltered. Admiral Markham in his report stated that "Churchill would some day be a famous harbour".

In 1886, Commander A. R. Corden made a survey of Churchill Harbour and he noted the soundings in fathoms at low water. Outside the entrance of the harbour, the depth was from 9 to 13 fathoms, decreasing until opposite the Hudson Bay warehouse it was 5 fathoms.

Port Nelson.—Port Nelson at the mouth of the Nelson River in lat. 57° N., long 92° 30′W., is to be the terminus of the Hudson Bay Railway that is now in course of construction from Le Pas in Manitoba to connect the bay with Winnipeg and the other grain centres of the Great Canadian West. Port Nelson is a more exposed harbour than Churchill and at the mouth are large shoals and sand bars that will have to be dredged before it will be a safe harbour from the strong gales that ravage Hudson Bay.

Great difficulty has already been experienced in landing lumber, machinery and construction materials at Port Nelson. In 1913 several vessels that arrived off Port Nelson in the month of August were obliged to anchor far out from the mouth in order to avoid grounding, and after waiting there for two or three weeks were obliged to throw overboard part of their cargœs and to return, without having landed the rest, before they became frozen in. The Alette ran ashore with three million feet of pine on board and two barges destined for the port were lost. The transport Caerense was wrecked on a sand bar 20 miles from the mouth of the river and totally lost. The Alkazar with two million feet of lumber was obliged to anchor 15 miles out to sea from the mouth of the Nelson River in order not to run aground and after jettisoning part of her cargo was obliged to return to Sydney, Cape Breton without having been able to land her cargo.

It seems probable that the railway will eventually have to be continued to port Churchill, which is a much better port and the line will only have to be prolonged some 70 or 80 miles over comparatively flat country.

In 1886, Commander Gordon visited the mouth of the Nelson river, and made soundings of Nelson harbour, which were given in feet at low water. It was unsafe to take the ship nearer than 13 miles the mouth of the river, and the soundings were accordingly made, in Nelson harbour, in a boat. The channel from the Nelson river, into the bay is narrow and tortuous, with mud flats on either side, and Gordon reported that silt and mud, brought down by freshets in the spring of the year, would fill up any artificial harbour that might be made at Nelson. The most direct line of soundings gave the depth from 5 feet near the shore and 33 feet near the ship and 14 feet were found a short distance from the ship. Commander Gordon came to the conclusion that it was impossible for a vessel drawing any depth of water to get within 12 miles of the mouth of Nelson river, and that Churchill harbour is a natural harbour, where the tide rises 15 feet 5 inches at spring tide and 8 feet at neap tide, and that it was a very much better place for vessels to load than the mouth of the Nelson river could possibly be made.

The entrance from Port Churchill and Nelson to Liverpool is apout 2900 miles or about the same distance as from Montréal to Liverpool.

When the railway is completed great impetus will be given to the development of the fisheries and mineral industries of the bay, and during four months of the year tramp ships will be able to relieve the congestion of the grain trafic as the grain route to Liverpool by way of Port Nelson is 1000 miles shorter than by the way of the port of Montreal and the railway mileage is much less; consequently there will be a saving in distance of a 1000 miles of rail and river carriage in favor of the Hudson Bay route. Regina, Saskatchewan, which may be taken as the centre of the western farming lands is about 800 miles by rail to either Churchill or Fort William on Lake Superior. Le Paz's about 430 miles from Port Nelson and about the same distance separates Winnipeg from Le Paz. Edmondton in Alberta is about 1100 miles and Saskatoon 750 miles from Port Nelson.

Fullerton Harbour.—Fullerton Harbour is quite small, with room for about three ships, and is fully protected by the islands and reefs surrounding it. The usual entrance is from the westward, where the channel is not above 50 yards wide, and the water at high tide is only five fathoms deep. The eastern entrance is narrower, and a ship obliged to make several sharp turns when passing through it. Owing to the low even coast, without any landmark in the vicinity, the position of the harbour is difficult to locate without entering the wide danger-zone of shoals as the islands are very low and extend more than five miles out beyond the harbour. Surveys made in 1904 show that a fairly safe channel will be found by keeping well to the eastward of the harbour, and by then following a northwest course, keeping in line the beacons on a small island about a mile outside the harbour. When the beacon Island is reached the ship should pass in mid-channel between it and the adjoining island to the westward; passing these, the outer harbour island should be given a wide berth, until the entrance to the harbour is opened fully, a long shoal extending from the western point of the island.

The spring tide rises 16 feet and the neap tide 11 feet at Fullerton Harbour and the Magnetic variation is 18–W.

EAST COAST—HUDSON STRAIT.

The east coast of Hudson Bay may, for descriptive purposes, be divided into three portions, namely, the northern part extending from Cape Wolstenholme to Portland promontory; the middle section lying between Portland promontory and Cape Jones, and the southern portion from Cape Jones to the south end of James bay. The northern and southern sections are very similar in character, the shores being formed of low rounded hills of gneiss or granite, rising very little above the wide drift-covered valleys; and inland, presenting a slightly rising plain broken by long, rocky ridges, hardly worthy of the designation of hills. The shores are rocky at points, where the bays are fringed by sand or boulder beaches. The water for a considerable distance from land is shallow, and the bottom very uneven, with rocky ledges and sharps ridges of boulders, which when they rise above the surface, from the wide fringe of small islands characteristic of these portions of the coast. From the above description, it will be seen that the greater parts of both the northern and southern sections of the coast are dangerous to approach with ships drawing any considerable depth of water, especially in the present unsurveyed state of the waters.

Central portion.—The central portion, however, from Portland promontory to Cape Jones at the entrance of James Bay, differs from the coast to the north and south of it, being bold, with hills often rising directly from the water to altitudes of a 1000 feet and upwards. Chains of islands, lying from half a mile to five miles from the coast with deep water between, extend along more than half this section, and afford excellent shelter for the largest ships, as well as a safely protected channel for small craft.

Geological formation.—Low reports: "The rocks of the entire east coast of Hudson Bay are very ancient and with the exception of those which form the chain of islands along shore between Portland promontory and Cape Jones; and also a narrow margin on the part of the coast in the same region, they have all been cut by the granite which has not only intimately penetrated them but its heat and pressure has so changed them to crystalline schists and gneisses that only in a few places can any trace of an original redimentary origin be found. The unaltered sedimentary rocks with their associated sheets of trap and diabase bear not only a remarkably close resemblance to the so-called Cambrian rocks of other parts of the Labrador peninsula, but also to the iron-bearing rocks of the southern shores of Lake Superior and the Animikie and Nipigon rocks to the north of Lake Superior."

Granite irruption—The granite eruption was co-extensive with the area now known as the Archaean region which embraces the greater portion of Eastern Canada and extends southward into the United States, thus occupying fully a third of the northern half of North America. The irruption of the granite was almost universal over this vast region, and it is now found in large areas where no remnants of the former sedimentary crust remains.

Oldest Sedimentary rocks in Canada.—Mr Low reports, "The close ressemblance of this series of (sedimentary) rocks occupying over an area extending from the southward of Lake Superior to north of the Arctic Circle, and from the eastern part of Labrador to the neighbourhood of the MacKenzie river shows that the conditions under which they were deposited must have been nearly identical throughout this wide area. The finding of new areas of these rocks as the northern country is more fully explored points to an almost continuous deposition of this formation over the whole Archaean area of Canada. No fossils have as yet been discovered in any of the beds of this formation, but the presence of certain concretionary forms in the limestones and the amount of carbon in many of the shales lead to the belief that at least low forms of life existed at the time these rocks were deposited. The lack of fossil evidence as to their age, which is taken to be very great, makes their classification in the Cambrian probably erronous, as in all likehood they are of pre-Cambrian age and in the opinion of the writer are the oldest known sedimentary rocks of Canada."

Richmond Gulf to Ungava Bay Geology.—"The rocks met with along the greater part of the route from Richmond Gulf to Ungava Bay have been classed as Laurentian. They are composed chiefly of more or less foliated granite made up of felspar, quartz, mica and hornblende, with minerals of decomposition. The felspar is chiefly orthoclase, and varies in colour from red through pink to white; quartz is always present and often in considerable quantities, and the mica and hornblende are genrallly found together, but at times one or other is absent.

Dyke rocks.—True eruptive masses are also represented by smaller areas of dark-greenish basic, granite composed largely of plagioclase, quartz, hornblence and mica; and also by dyke-rocks, usually more or less altered diabase, which appear to be much newer than the rock cut by them, there are also a number of dykes of fine-grained, dark-red syenite in the granite area about Clear-water Lake.

Mica-schists.—"Intimately associated with the granite is a series of more or less quartzose, mica-gnessses and mica-schists, interblended with hornblende schists and hornblende gneisses, and at times with a quartz-magnetite-gneiss. These are cut by newer granite and their present highly crystalline condition is thought to have been caused by the deep-seated intrusion of great masse of granite.

"The age of these bedded schists is for the most part very great, as some of them were altered by the granites and subsequently deformed along with the granite, after which they have been deeply sculptured and denuded before the deposition of the iron-bearing Cambrian rocks. The Cambrian rocks of the east-coast of Hudson Bay have a breadth of 20 miles at Richmond Gulf.

Diabase dykes.—"Two diabase dykes were seen on the portage leading to Clearwater River the first five to fifty feet in width; the second seventy feet wide there is another 30 feet wide at the head of an island in the Clearwater, a short distance from the last dyke. At the third portage below Clearwater Lake, is another diabase dyke one hundred and fifty feet wide. Near the contact with the gneiss it is very fine-grained, but towards the middle is much coarser; it is dark-green in colour and contains a considerable quantity of dissiminated pyrite. The rock is now about half decomposed to serpentine, the decomposed portions forming irregular blotches of an apple-green colour.

Acidic dykes.—"The granites are also cut by acidic dykes in the form of a dark-red, compact syenite, largely composed of flesh-red orthoclase with a little hornblende, but no visible quartz.

Granite intrusions.—"In 1897, along the south shore of Hudson Strait and about Ungava Bay, the writer found the Cambrian rocks passing from unaltered black shales, grits and ferruginous, siliceous delomite with associated greenstones, into garnet-bearing mica-schists and gneisses, quartzites and crystalline limestones, in consequence of adjacent intrusive masses of granite and associated dykes of pegmatite. (See Low, part L. Annual Report, Vol. IX. Geological Survey of Canada, 1898.)

EAST COAST HUDSON STRAITS

Iron deposits.—"More attention", writes Low, "has been given to the iron deposits of the east side of Hudson bay than to any other of the mineral deposits of the north. In 1877, Dr. Bell explored the east shore of Hudson bay, as far north as Dufferin, and in his report on this exploration called attention to the deposits of iron ore found in a bedded series of rocks, chiefly sandstones, cherts and dolomites. These rocks he found forming the islands along that coast from Cape Jones at the north of James bay, to Cape Dufferin, some 200 miles further north. A strip of the same rock occupies the mainland from the vicinity of Great Whale river to beyond the head of Richmond gulf, a distance of 120 miles.

"The iron ores of value were found to be confined to the Nastopoka chain of islands, which extend northward from Little Whale river for a distance of 100 miles.

"A further examination of these iron bearing rocks was made by the writer (Mr A. P. Low) during the summers of 1898 and 1899, and more closely during the summers of 1901 and 1902 when engaged in the work for a private company.

"These iron-bearing rocks of the east-side of Hudson bay, have a close resemblance to those of Lake Superior, so famous for the amount and quality of their associated ores of iron. They consist of bedded sandstones, cherts, shales, graywakes, and dolomites, associated with great outflows and sills of trap.

"The iron ores have a greater thicknes and are richer in the islands in the middle of the chain than elsewhere. The beds increase in thickness as the beds are followed northward and reach their maximum development on Davieau island and northward to McTavish island, where they have a thickness of 50 feet. These measures can be traced southward from the Nastapoka chain in the outer islands lying along the coast for upwards of 150 miles being last seen on long island just north of Cape Jones, where they are overlaid by considerable thickness of trap.

"The ore is either a dark-gray silicious rock, containing magnetite with small quantities of Ankerite or a red jaspilite rich in haematite ore. The upper silicious ores containing magnetite ore too much broken and too intimately mixed with the cherts for profitable mining. The rusty character of the rock is due to surface decomposition af ankerite to limonxite. The ores vary from a lean ferruginous chert to a rich ore containing upwards of 60 per cent of iron. Large quantities of the better ores between the beds of gray silicious rock, and their intimate association with finely divided silica, point to their disposition and enrichment from the infiltration of waters carrying solutions of iron and silica which were deposited in the waters in cracks and between the bedding of the already formed siliceous rocks. This mode of formation has been described by Van Hise for similar ores in the Lake Superior region.

"On the three southern islands of the chain there is a gradual change in the nature of these measures. They pass into a brownish-black siliceous shale, rich in iron and containing considerable carbon as small scales of graphite. This is the form in which they are found to the southward, on the islands as far as Long Island. The thickness of the division is very constant on the islands northward to McTavish, but it does not occur on Cotter island.

"The typical rock of the second division is fine-grained and very siliceous with minute particles of silica coated with red oxide of iron, forming a coarse impure jasper.

"These jasper rocks usually occur in their broken bands, the partings then being filled with a finaly-divided mixture, of haematite, magnetite and jasper. The haematite is greatly in excess of the magnetite. The association of the iron ores and the jasper is intimate, and they have been deposited simultaneously from aqueous solutions probably leached from the cherty carbonate measures above. Microscopic sections from these rocks are almost identical with those of jaspilite figured by Van Hise, in his monograph on the iron-bearing rocks of the Lake Superior region.

"The amount of area in this admixture of haematite and jasper varies greatly. When the ore is poor, the jaspery rock predominates and encloses lenses of haematite, while where the haematite is most plentiful it encloses similar lenses jasper. The detailed description of these rocks shows that the measures of this division do not occur on all the islands, being wanting on Flint, Belanger and Ross. On Anderson they are represented by a few thin beds not rich in ore, while on Clarke they form the summit of the section with a thickness of 80 feet. They reach their maximum development on Gillies and Taylor, where the ores are richest and more concentrated. Farther northward they become thinner and poorer in ore, being 20 feet thick on Davieau and only 8 feet thick on McTavish, where they die out. No trace of these measures is found underlying the upper rocks on the islands, south of the Nastapoka group. The richest ores are found in beds, several feet in thickness, containing ore pratically free from jasper, and ranging in iron values from 30 to 60 per cent. Most of these ores, however, would require separation from the bands and lenses of jasper before becoming sufficiently rich to be economically treated in the furnace.

"The position of the ores in the islands separated from the mainland by a sound varying from a mile to four miles in width with excellent, almost tideless, harbours, constitute ideal conditions for shipment. The mining of the ore would also be easy and cheap, if advantage were taken of the great waterpower of the Nastapoka river, which falls 160 feet into the sea within a few miles of the best ore deposits, and from which electrical power might be generated easily and cheaply. Owing to the distance of these ores from the nearest furnaces, and the want of experience in the navigation of Hudson strait, the shipment of them as at the present out of question. No coal is found in Hudson bay, so that economical smelting near the mines can not be attempted, until electrical smelting becomes practicable some time in the future.

"In all the fields where extensive areas of iron-bearing rocks occur in the Lake Superior region, the search of drilling has disclosed large deposits of concentrated ore, and there is little doubt that such a search in the Hudson bay region would lead to similar discoveries, as the manner in which the ores occur is favourable for such concentrations."

Nastapoka-iron beds.—Thirty mining claims on Clarke (3000 acres), Armstrong (500 acres), and Curran (800 acres) Islands have been assigned by Order in Council of the Federal Government at Ottawa to a Montreal Corporation, the Ungava Miners and Traders Limited. Two of the islands are said to contain about 365,000,000 tons of the finest quality of iron ore. The ore-beds vary from seven to fifteen feet in thickness. It is intended, if possible, to smelt the ore on the islands. which are about five miles from the mainland opposite the northern end of Richmond Gulf. The Nastapoka claim is composed of forty-four islands, large and small, there being ten islands upwards of five miles in length. They are formed from beds of stratified unaltered rocks, all dipping gently seaward and presenting steep cliffs, from 100 to 400 feet high towards the land. The rocks are largely silicious and nearly every bed is more or less ferriginous. while some of them often of considerable thickness are almost pure iron ore. The ore is largely magnetite or a mixture of magnetite and haematite when associated with the sandstones, grits and jaspylitebut with the limestones and dolomites, beds of siderite and ankerite are found, and as these, from analysis of specimens obtained by Dr. Bell, in 1877, contain a large percentage of manganese they form excellent ores for Bessemer steel. The beds compare favorably with the immense deposits worked to the southward of Lake Superior; and the United States Steel Corporation is understood to have staked a number of claims on the large islands. Mr. Low took photographs in 1898 of some of the thick beds (80 feet) of almost pure magnetite. There is a fine fall (60 feet) near the mouth of the Langland River on the mainland, which consists of high granite hills. There are no harbours on the mainland, but there is a fine anchorage in a wide bay on the inside of Davieau island.

From an economic standpoint, the investigation of the rocks along the east coast of Hudson Bay has shown that extensive deposits of iron ore occur in the unaltered sedimentary rocks of the Cambrian, These ores occur as beds interstratified with certain silicious rocks of the middle portion of the series, and appear to have been deposites from solution in a shallow sea."

Carbonates.—"The upper beds of ore occur as ankerite or a carbonate of lime, magnesia and iron, which renders the ores valuable in the manufacture of Bessmer steel. Beneath the carbonates are silicious beds in which the ores are present as oxides either magnetite or haematite, or a mixture of both, associated with red jasper. These beds may be due in part to infiltration of iron leached from the carbonates above, but much of the iron appears to have been originally deposited in the present beds. The carbonate ores are found on all the islands of the Hopewell chain, on a number of the Nastapoka islands, and on Long island. The greatest thickness of ore noted was about twenty feet and it was broken by partings of black chert."

Oxides.—"The oxides are largely developed in the Nastapoka islands where their thickness is often more than fifty feet, but all of these measures are silicious and only part of them sufficiently rich for profitable mining. The oxide ores also occur on the islands and southern shores of Richmond Gulf but of all the exposures seen there, none were sufficiently rich to be worked."

Sulphides.—"The intrusion of granite into the large areas of basic rocks met with along the coast at intervals from Kovik river to the southward of East Main and the foliation of these latter by pressure has caused a segretion of the sulphides. always found scattered through the diabases, into long lenticular masses parallel to the foliation. And large veins of quartzose granite and pegmatite from the granites penetrating these basic rocks have also taken up some of their sulphides which may prove valuable ores. The area northward from Portland promontory to the vicinity of Mosquito bay appears to be the most promissing for the discovery of sulphide ores in the form of pyrite, pyrrhotite and chalcopyrite as the diabases of that region have been greatly crushed and foliated and are also penetrated by a great many veins of quartz. Little time could be given to the examination of that area and the chance specimens obtained from the mineral deposits there show that they contain a small quantity of nickel and copper without gold, but results obtained from hurriedly collected samples need not be taken as an indication of the absence of these metals in paying quantities in these rocks. The Paint Hill area of squeezed trap contains in many places large segregation masses of pyrite which carry a small quantity of silver but no gold. Pyrites is also plentiful in the limestones of Long Island and the islands north of Cape Jones. There is a bed of silicious dolomitic limestones full of cavities a short distance below the thick capping of diabase which extends along the coast from beyond the north end of Richmond Gulf southward to the head of Manitounuk Sound. In many places the cavities of this bed are filled with galena accompanied by pyrite and blende, all of which appear to have been leached out of the overlying diabase and to have been deposited in the cavities of the limestone. These deposits have not as yet proved to be sufficiently concentrated to allow profitable mining."

Rocks suitable for building and decorative purposes.—"In the upper portion of the Cambrian formation, as seen along the coast south of Great Whale River, on the Manitounuk islands, and along the coast, below the traps, are beds of fine-grained limestones, some of which apparently be suitable for lithographic purposes. In many places the granites would afford excellent and beautiful building stones; most noticeable among these is the Augite-syenite found on Walrus island, of the Paint Hills group. The rock is a beautiful porphyry holding pearly crystals of feldspar varying in colour from pink to violet or flesh-red, set in a dark-green ground-mass. Large slabs of this rock could easily be obtained which would be admirably adapted for interior and exterior decorations."

Ungava Railway Company.—An application was made in October 1913, to the Parliament of Canada for permission to construct a railway under the name of the Ungava Railway Company, from the mouth of the Great Whale River or from a point between the mouth of the Great Whale River and the Nastapoka River on the east coast of Hudson Bay to Aylmer Sound on the Gulf of St. Lawrence or to some other point on the Gulf of St. Lawrence between the parallels of 50 and 51 north latitude.

Richmond Gulf.—Richmond Gulf is a large body of salt water, occupying a depression behind the coastal range of trap-capped hills. Its greatest length from north to south is thirty miles while its greatest breadth along its southern shore is twenty miles. In form it is roughly triangular with the apex of the triangle at the north end. The western side is occupied by sharp cliffs, formed of bedded rocks capped by a thick overflow of trap. These cliffs are very jagged, and indented by deep bays, and as the rocks rise as they extend inland, the cliffs of the headlands are fully 1,500 feet above the water, while those at the head of deep bays are not above 1000 feet to their summits. Along the south and eastern shores the bedded rocks have been faulted and in places replaced by granites, so that the coast is more irregular and less bold than along the western shore, the hills rising from 500 to 1000 feet.

Islands and Rivers.—The southern part of the lake Is covered by large high islands formed from tilted beds of the stratifield rocks and traps. A large number of large streams enter the lake on its east side; among these the Clearwater is the largest while a couple of miles south of its mouth is the Wiachewan, which has a beautiful fall of 315 feet where it descents to the lake. Further northward is the Deer river which like the Clearwater flows out of Clearwater lake. At the north end another fairly large stream called the North River flows in from the eastward, through a wide valley.

Trees.—The coast outside Richmond gulf is almost treeless only small spruces growing in protected gorges. The change when the lake is entered is very striking as all the slopes of the hills and islands are well wooded with spruce and larch and only the summits of the hills are barren, showing that the climate is more moderate away from the cold waters of Hudson Bay. Balsam poplar is found as straggling trees on some of the islands showing that the northern limit of this species almost coincides with that of the supposed much hardier spruce and larch. The country between Richmond Gulf and Clearwater Lake has a great sameness of character and consists of plateau rising abruptly from the coast to a general elevation of 750 feet. Its surface is broken by rounded ridges of granite hills that rise from 100 to 400 feet above the general level, while the valleys between the ridges are filled with lakes, generally long and narrow; those of each valley being connected by short rapids. The largest rivers like the Clearwater, have deep valleys cut below the general level of the plateau, but these only extend a few miles inland, so that beyond fifty miles from the coast all the water courses are but little below the level of the plateau. About one half of the plateau is barren, the trees being confined to the margins of lakes and the lower lands of the valleys. The forest is wholly composed of black spruce and larch, the former constituting about ninety per cent of the whole. The trees are small, slim and grow close together on the lower grounds, but on the higher they are separated by open glades. The largest trees never exceed twelve inches in diameter three feet from the ground, nor are they ever more than 30 feet high. The small streams and lakes are well stocked with trout and whitefish.

Fish and Specimens.—The waters of Richmond Lake are plentifully stocked with fish including, arctic trout, brook trout, and whitefish. Dredgings made by Mr. Low, in from 15 to 25 fathoms of water, in a long narrow bay in the south-west angle of Richmond lake, where the bottom was found to be soft mud, procured the following species:—Pecten (Camptonectes); Groenlandicus; Modiolaria discors; Portlandia glacialis; Mucula expansa; Astarte Banksii, var. striata; Astarte crenata; Gray, var-Macoma calcarea; Thracia myopsis; Saxicava arctica; Tornicella marmorea; Litorina rudies; and the following sponges:—Suberites montalbidus; Craniella cranium. The above species are common in the Pleistocene sands and clays of the Gulf of St. Lawrence and show that the present conditions of the waters of Hudson resemble those of the St. Lawrence region during the close of the glacial-period.

Entrance to Richmond Gulf.—The entrance to Richmond or Hazard gulf is situated eleven miles north of the mouth of Little Whale river, and opposite the north end of Belanger island, the second southern island of the Nastapoka chain. The entrance formed by a deep rent in the rocks of the coast, and is about two miles long and varies in width from 100 to 400 yards. The water is very deep and the walls of the channel rise in perpendicular cliffs from 100 to 1,500 feet, the highest, increasing inward from the coast owing to the bedding of the rocks dipping seaward. This narrow channel connects Richmond gulf with Hudson bay and in consequence the water rushes in and out through it with a great velocity, with the rise and fall of the tide allowing only short periods of quiet when the tide is high or low.

Tide.—The average rise and fall of the tide in this part of Hudson Bay is about six feet, and is sufficient to cause a tremendous rush of water in and out through the narrow channel. The difference between high and low water in the lake is about 20 inches.

Inland Lakes.—Inland of Richmond Gulf are numerous fine lakes that abound in large trout and brook-trout, whitefish and suckers. In Seal lake are also found harbour seal, a hundred miles from salt water and 800 feet above sea-level. Clearwater lake is a large and beautiful body of water. 45 miles long and 20 miles across; the water is remarkably clear, deep and cool, and well stocked with trout, whitefish and suckers. Minto, Stillwater and Natuakami Lakes are also fine bodies of water.

The surrounding country is formed of rounded Laurentian hills that rise 200 to 500 feet above the lakes, the land becoming lower and flatter to the north and east, where large areas are flat and swampy. The forest is similar in size, growth and distribution to that already described near Richmond Gulf, and the woods are continuous over the low areas. Barren ground caribou are plentiful on the sandy islands above Natuakami Lake and in the summer time swarms of tormenting flies are met with in the valleys. Willow ptarmigan are found everywhere in great numbers, but other feathered game is scarce. A few families of wandering Indians inhabit these areas.

Navigation.—On June 6, 1899, Mr. Low started from the Hudson Bay Post at Great Whale river in a small yacht and passing up Manitounuk Sound and through the Boat-opening saw a narrow streak of comparatively open water along the coast to the northward, with heavy ice outside. On the 8th of June they had no difficulty in reaching the mouth of the Little Whale river, as a light cast wind had driven the ice off shore. Here he found and relieved several Eskimos families that were in a starving condition. He continued the same day to the mouth of Richmond gulf, where he found the tide rushing out strongly and carrying with it much floating ice. The yacht was nearly wrecked in the narrow channel by being dashed by a sudden squall against the steep rocky walls. They finally made a small harbour just inside the narrows and getting out two anchors rode safely through the heavy gale of that night which was accompanied by snow and squalls off the heads 1,000 feet above them, that caused the boat to tremble and sunk her several inches in the water as they burst down upon her. During their stay in Richmond Gulf (June 9th to 22nd) the ice in Hudson Bay had been closely pressed in upon the coast filling up Nastapoka sound and completely blocking navigation. They remained in Richmond Gulf which was found free of ice, until the 22nd of June, when they sailed out of the gulf and managed with considerable difficulty to pick their way through narrow leads to the mouth of Little Whale River. Here they remained hemmed in by the ice, until the 2nd of July when a strong breeze off shore opened a channel and permitted them to sail south to Great Whale River. At Great Whale River they were again delayed by ice until the 7th of July when they were advised by all the Eskimos to abandon their proposed trip to the Belcher islands which lie about 70 miles off the coast, and about which, and owing to the prevalence of the westerly winds during the early summer, the ice would be very thick. This advice proved correct as the Hudson Bay Company's ship "Lady Head" was beset with heavy ice as far south as Bear island in James Bay, where the ice was left on the 20th August. Sailing southward from Great Whale River, much ice was encountered for upwards of 60 miles until they passed into the sound between Long island and the mainland, where the last of the ice was encountered on the 11th of July when they reached Cape Jones, 85 miles from the mouth of the Great Whale river, and which marks the entrance of James Bay.

Manitounuk islands.—Low describes these islands as follows: "The Manitounuk chain of islands is about 25 miles long and extends to within 6 miles of the mouth of Great Whale river. The islands have a close resemblance to those of the Hopewell chain, being composed of similar stratified beds capped with great thickness of dark-green trap, often roughly basaltic in structure. The sound formed by these islands is a charming place after the barren, inhospitable coast to the northward. The colours of the trap and underlying stratified rocks in the high cliffs of the islands contrast beautifully with the dark-green of the spruce and the lighter shades of the willows and mosses. The prevailing colours of the stratified sandstones are various shades of pink; the limestones vary from buff through cream to light-blue, while the trap weathers a warm brown and purple and where the cliffs have recently fallen the colour is dark-green, so that there is no lack of colour in the picture."

Fort George.—Fort George is a port of the Hudson Bay Company, situated on an island at the mouth of the Big river, and is the headquarters of the Whale River district. Here is found the most northerly cultivated land on the east coast of Hudson Bay. Excellent potatoes and other root crops are grown here and a good herd of cattle adds to the comfort of this northern outpost of civilization.

Big River.—The Big River is one of the largest streams of the peninsula, and takes its rise in the central area of the peninsula. The distance from the mouth of the bay and the East Main river is 115 miles and the general course is S. 10° E. The Big river discharges by two main channels separated by a wide flat sandy shoal. The northern channel is that used by large vessels, as it leads past a small safe anchorage called Stormness harbour situated among some rocky islands about three miles northeast of the river. This channel has two sharp bends and is difficult to navigate, whereas the south channel runs straight seaward from the mouth of the river, the boat channel runs due south sixteen miles to Earthquake island, so called from the legendary trembling of the island during a battle between the Crees and Iroquois.

East Main.—A small trading post is situated near the mouth' on the southern bank of the East Main river, which is 138 miles from the Big river. A large herd of cattle is kept here as well as a number of sheep, and the surplus stock is distributed annually to Rupert House and Moose Factory. The East Main river is not as large as the Big River, and drains the country between the latter and the Rupert. The rocks in the vicinity are Huronian, and the contry was explored by Low, of the Canadian Geological Survey in 1892-93, and a full account of it is given in the report on the Labrador Peninsula. (Ann. Rep. Surv. Can., Vol. VIII, (N. S.) pp. 77-102 L). From the mouth of the East Main the general trend of the coast is south-southwest for fifty miles to Sherrick mount at the entrance to Rupert bay, into which flow the Rupert, Nottaway and Broadback rivers, all of which have brought down large quantities of sand and mud. The coast along this portion is exceedingly low, and rocky hills only come out to the shore in a couple of places; elsewhere wide bays with sandy shores and boulder strown points are found rising slowly inland and faced with wide mud flats at low water. The islands off the coast are few in number, and owing to the shallow waters surrounding them, hard to approach. In fact, although the coast is free of islands, it is exceedingly dangerous to approach, owing to the shallow water extending out over a very uneven bottom covered with boulder ridges. According to the Jesuits the Indians have a tradition that diamonds exist in the banks of the East Main, and several prospectors have reported finding small diamonds, but since then no further developments have occurred to confirm the truth of the reported discovery.

James Bay

South and east Coasts.—The south and east coasts of James Bay are generally low, with a wide margin of swampy land above high tide, while between high and low water mark, wide mud flats sometimes extend for miles. As the coast is followed northward the flat swampy land is broken by rocky ridges; these increase in height and number, so that in the vicinity of Cape James the area of rocks exceeds those of swamp and drift. The shore is broken by long irregular points, and in many places is fringed with islands that extend several miles from the mainland; they are rocky or formed of drift. A chain of large islands lies parallel to the coast and about a third of the way across James Bay. These are composed of sand, clay and boulders, representing the higher parts of a terminal moraine of an ice-sheet from the Labrador side.

Sherricks Mount.—The coast to the southward of the East main river is even lower than the northward, and rocks only come out on shore in a few places. Islands are less numerous, and toward the mouth of Rupert bay are largely formed of drift. Sherricks mount, which marks the eastern entrance to Rupert bay, is a peninsula with a cone-shaped hill about 700 feet high, and it forms the most striking landmark of James bay. To the southward of the East Main river the whole bottom of James Bay has been silted up with sand and mud brought down by the large rivers flowing into its southern part, and in consequence, wide flats extend far out from the shore, increasing in width as Rupert bay is approached, so that in that bay, the only navigable parts are in the channels cut out by the currents of the rivers flowing into it, and even these rarely have a depth exceeding ten feet. (See Low's report Ottawa 1898).

Resources of James Bay.—The following account of the resources of Hudson bay is taken from the official report of Mr. A. P. Low: —"The country to the south of James Bay is flat, where nearly horizontal beds of Silurian and Devonian limestones are masked beneath a considerable thickness of stratified clay and sand. These deposits of drift thin out towards James Bay so that for upwards of 50 miles inland from the mouth of the river, the land does not reach an elevation of one hundred feet above the sea. This great plain was once covered with large spruce trees and remnants of the forest are still found in patches along the banks or on the inlands, but elsewhere it has been burnt and its place taken by a thick growth of small aspen and white birch. Much of the plain would undoubtedly make fine agricultural land and the climate is sufficiently temperate to allow the successful growth of hardy cereals and root crops, as these are now grown at Moose Factory, which is less favorably situated than the country further away from the influence of the cold waters of James Bay. A drawback to settlement exists in the swampy nature of large areas having a heavy clay subsoil, but this might easily be overcome in many places by drainage to the rivers, and a large track of country made fit to support a considerable population when it is rendered accessible, by railways.

Climate.—"The southern part of Hudson and James Bays may be classed as cold-temperate, while the northern part is truly Arctic. The temperate climate may be said to extend to Cape Jones or to be limited to the shores of James Bay, while to the northward it is subarctic or arctic and unfit for agricultural purposes of any kind, at Rupert House in the southern part of James Bay excellent root crops are grown annually. Oats have also been successfully grown and no doubt the hardier varieties of wheat will also ripen. In 1896 and 1897 wheat ripened at Waswa-napi, in latitude 51° 45' or 122 miles south of Rupert's House, from seed sent by Dr. Robert Bell to the officer in charge of that post. Rupert House is situated practically upon the seashore and consequently is directly influenced by the cold ice-laden waters of James Bay which must considerably lower the temperature in early summer. Such being the case there can be little doubt that better crops could be raised a short distance farther inland, away from the direct influence of the sea. There is no doubt that the large area of country situated to the south and south-east of James Bay and underlain by good clay soil capped with sandy loam would with proper drainage make excellent farming land capable of raising any crop grown in the North-West territories. At the mouth of the East Main river, roots are grown to perfection and abundant crops of wild hay are gathered yearly to feed the large herd of cattle kept there. At Fort George, at the mouth of Big river, good crops of potatoes and other roots are grown annually, and cattle are also kept. This is the present northern limit of agriculture as nothing is grown at Great Whale river where sandy soil aids the climate to prevent the successful cultivation of any crop.

Timber.—"The southern portion of Ungava is partly wooded: the northern tree limit, leaving the coast of Hudson Bay near the north end of Richmond gulf, curves northward and crosses the route to Lake Minto about 20 miles inland, thence bending eastward and southward recrosses the Leaf River about 100 miles inland and comes out on Ungava bay near the mouth of the Koksoak river. The trees near the northern limit are all short and stragglin; they grow only in the protected valleys and their struggle for existence is manifest by the number of dead tops and branches found everywhere. Black spruce and larch, or tamarac, are the last survivors of the forest to the south and the latter tree grows to about twice the size of the spruce. The white spruce reaches nearly as far as north as the black spruce, and the balsam poplar comes neat in order, followed quickly by the balsam fir, all of which trees are found in the islands of Richmond gulf. The banksian pine grows as far north as the Great Whale river, which is also the limit of the white birch and aspen.

"The islands of the coast between Cape Jones and Big river, with the exception of a few southern ones close inshore, are all barren. To the southward of Big River the trees gradually extend out on the islands so that at Cape Hope, Lat. 52° 30′, all of them are wooded.

"Merchantable timber is found in the valleys of all the rivers northward to the East Main River and pulpwood to the Big River, beyond which, although much of the country is well wooded the trees are small and the branches continue to the ground, causing the stems to be full of knots and consequent'y of little value.

West Coast, James Bay.—The west coast of James Bay is one of the lowest and most difficult shores in the world to navigate and is particularly hazardous for canoes. At high tide the water extends to a continuous marsh, about three miles back of which lies real land, while at low tide the water is five to eight miles distant from the outer edge of the marsh with only muck and mud between. From Fort Albany to Moose Factory there are only a few places where it is possible to land on a sand bar or shoal point without wading through the marsh and these landing places must be reached at the flood tide and left at the same tide, for when the tide is at its ebb one is miles out of sea. This condition and the consequent necessity for going far out to sea and the tendency of sudden squalls which raise immense waves of the combing sort renders canoe navigation a dangerous undertaking.

Montreal and James Bay Railroad —A charter has recently been applied for to build a connecting railroad between Montreal and the Transcontinantal railroad in Northern Quebec, with a continuation down the Nottaway river to James Bay where there is a good harbour for vessels of deep draught. When this railroad is finished, James Bay will rapidly spring into favour as a summer resort for tourists, sportsmen and prospectors, where the climate is delightful, the fishing and bird-shooting of the best, and the rocks of the surrounding country offer great possibilities to the mineralogist and the prospector; while the country through which the Railway will pass, consisting as it does over the greater portion of its area of heavy clay soil and sandy loam, is admirably adapted to the cultivation of root and grain crops and the raising of cattle, sheep and other animals.

Several million of acres have been granted by the Government to the Railway Company which has, according to report, already formulated plans for placing thousands of setlers upon the vast area of agricultural lands that will be through open the settlement.

CHAPTER XIV

HISTORICAL SUMMARY OF ARCTIC AND POLAR EXPLORATIONS.

THE NORTH-WEST PASSAGE

Geological Summary.—A summary of Arctic Explorations must be confined to a brief account of the objects and achievements of the various expeditions, and, consequently, loses much of the charm of the matter of fact manner in which the dangers and difficulties and hardships are recorded in the different narratives.

The following brief summary gives only an inadaquate conception of the immense treasures of money and lives that have been expended by the nations to explore the northern ice world in search of a passage from the Atlantic to the Pacific, and to attain the apex of the earth, the North Pole.

The struggle for the North Pole and a Northern Passage by way of the Polar Ocean between Europe and Asia began one hundred years before the landing of the Pilgrim Fathers at Plymouth Rock, being inaugurated in the year 1527 A. D. by King Henry VIII of England.

It was in the ninth century that the problem of a northern passage to Asia seems to have been first proposed; and the first northern expedition by sea, of which we know, was that of OTHERVIE, who sailed from Drontheim to the White Sea. Iceland was also discovered about the same period, and subsequently, Greenland, by means of a voyage from that island in the year 970.

The acquirement by Spain of all the richer parts of America followed close on the discovery of Columbus in the year 1492; at the same time Portugal laid claim to the southern routes, by the Cape of Good Hope and Straits of Magelland, to India and China, in consequence of the discoveries of Vasco da Gama.

England was thus debarred from these new fields of wealth, and it was the search of a northern unclaimed passage to the East which stimulated, in the reign of Elizabeth, the awakening enterprise of London and Bristol merchants to outfit expeditions under brave and adventurous seamen.

Cabot.—The first attempt was made to the eastward, around the northern coasts of Europe and Asia. Although failing in the main object, a large and profitable trade was opened with northern Russia, which led to the founding, by Sebastian Cabot, of the Muscovy Company of London in 1553. Sebastian Cabot with his father, Jean Cabot, of Venice, were despatched by order of the King of England, to discover a passage to India and, with the exception of the earlier discovery of Newfoundland by the Norwegian Youth Biorn in 1002, have the distinction of being the original discoverers of Canada, as they landed on the shores of Labrador, Newfoundland and Nova Scotia in 1497, after having sailed as far north as Davis Strait.

Columbus.—The illustrious Christopher Columbus, born in 1436, was outfitted by the Kings Ferdinand and Isabella, of Spain in 1492 and with three small vessels sailed from Palos and landed on October 12th, 1492 on an island in the West Indes which he christened San Salvador. Columbus did not set foot on the North American Continent but, in 1498 and 1502 discovered the coasts of Venezuela and Central America.

Etymology Arctic.—The word Arctic is derived from the Greek word Arktos, meaning bear, and was first applied to the seven stars which constitute the constellation of the Great Bear. Canada was called after the Iroquois word, Kanata, meaning a village or collection of huts. America derives its name from the Florentine, Amerigho, Vespucci, who after having accompanied Columbus on his last voyages, made several explorations along the coast of South America. But subsequent research has disclosed the fact that the name America is Indigenous and is the name given to a chain of mountains the Sierra Amerique, and to an Indian tribe, los Amerriques, on the coast of Nicaragua. It signifies, "country of winds".

Greenland.—The Danes and Scandinavians unknown to the rest of Europe at the time appear to have discovered Iceland and Greenland in the tenth century; and to have also visited Labrador, Newfound land and Canada long before the subsequent discovery by Columbus and Sebastien Cabot. Greenland was so called on account of the abundance of lichens and moss that cover its coasts in the summer.

Cotreal.—In 1500-1502 Gaspar and Michael Cotreal made two voyages to Greenland and affirm that they reached the 60th degree of latitude. They discovered the straits of Gaspar and several islands, together with the strait which was called Anian by them.

Cartier.—From 1508 to 1535 Jacques and Aubert Cartier made several voyages for the purpose of exploring a new passage to the countries from which Spain derived her treasure, and they discovered the Gulf of St. Lawrence.

In 1534 Jacques Cartier, of St-Malo, explored the St. Lawrence. The French, English and Spaniards then divided the possession of the American Continent between them.

Willoughby.—In 1554 Sir Hugh Willoughby and all his crew after having discovered Nova Zembla, died of starvation on Nokonief island.

Muscovy Company.—The Muscovy Company, through selfish motives, was unfavorable to the prosecution of a search for a northern passage to the westward, and nothing was attempted in that direction until 1576.

Frobisher.—The history of the exploration of the American Arctic opens with the first voyage of Sir Martin Frobisher, in 1576, which was said to afford a safe passage between the Atlantic and Pacific, through the north temperate regions of America, resolved to explore the strait. .

A piece of black earth picked up on Hall island was submitted to an alchemist, Baptista Angelo, who said that he had "by coaxing nature" obtained some gold from it. On the strength of this discovery, money was immediately raised for a second expedition, with the sole purpose of bringing back ore. Three ships were again sent under Frobisher, and returned well laden with the supposed ore. During the stay of the expedition in Frobisher bay, several skirmishes took place with the natives, a number of whom were killed. Fifteen ships were fitted out in 1578 for the third voyage, to bring home ore. Carried southward by strong currents, the fleet entered what was later called Hudson strait, and sailed several days westward through it before the mistake was discovered. If Frobisher had been on a voyage of discovery he might easily have entered Hudson bay, but the search for gold being his object he turned back, and entered Frobisher bay by passing through the strait to the east of Resolution island. On the first of August most of the fleet was assembled at the Countess of Warwick island, where the ore was mined and all the ships loaded by the end of the mouth. The ore finally proving worthless, nothing further was done to continue the discoveries of Frobisher.

John Davis.—In 1585. See page 296.

Davis.—On his second voyage, in 1588, Davis rounded Cape Farewell the southern end of Greenland and keeping northward along the west coast of Greenland, which he called the London coast, passed through the strait that bears his name into Baffin bay and reached latitude 72° 12', the farthest north of the period and only 1128 miles from the Pole. Leaving the coast of Greenland, he sailed west for forty leagues, where he fell in with the ice of the niddlepack of the whalers; a strong gale then forced him south along the edge of the ice, so that no land was seen either to the west or north.

Scores of hardy navigators, British, French, Dutch, German, Scandinavian and Russian followed Davis, all seeking to find a route across the Arctic ocean to China and the Indies.

Barentz.—William Baventz in 1594-96 sailed for the Dutch merchants of Amsterdam and made three attempts to accomplish the North-East Passage around Nova-Zembla.

George Weymouth.—In 1602. See page 296.

Knight.—In 1602. See page 296.

Hudson.—In 1607 Henry Hudson, when seeking a North-East Passage to the Indies, discovered Jan Mayen, circumnavigated Spitzbergen, and reached latitude 80° 23'N. He brought back accounts of the great numbers of whales and walruses, with the result that in the succeeding years those new waters were througed with fleets of whaling ships from every maritime nation. The Dutch specially profited by Hudson's discovery of Spitzbergen. During the 17th and 18th centuries they sent no less than 300 ships and 15,000 men each summer to these arctic fisheries and established on Spitzbergen, within the Arctic Circle, one of the most remarkable summer towns the world has ever known, where stores and warehouses and reducing stations and cooperages and many kindred industries flourished during the fishing season. With the approach of Winter all buildings were shut up and the population, numbering several thousand, all returned home.

The Arctic islands of Spitzbergen have hitherto belonged to no Government, but the discovery and exploitation of coal by American capitalists has drawn the attention of the European powers to the question of an international control. The coal mines are situated in Advant Bay and the American miners have worked there every summer since 1905. Germany has an important meteorological station and Great Britain has also mining interests there. It is now proposed in pursuance of a plan submitted to the powers by Norway, to declare Spitzbergen neutral territory open to all nations, but under the control of the three northern powers, Russia, Sweden and Norway; the administration to be controlled by a commission of three members, a Russian, a Swede and a Norwegian; the expenses of the Government to be defrayed out of taxes on the mines, land and other taxes agreed upon by all the signatory powers, including Great Britain, France, Holland, Germany, Denmark and the United States; the convention to be renewed every eighteen years.

Henry Hudson.—In 1610. See page 296.

Sir Thos Button.—In 1612. See page 297.

Hall and Baffin.—In 1612, James Hall and William Baffin went to the west coast of Greenland in search of a gold mine, at Cunningham fiord near the Arctic Circle, which was reported to have been worked by the Danes. No ore was found, but traces of old workings were discovered.

Greenland.—Greenland is by far the largest island in the world, having an approximate area of 575,000 square miles. The climate is very cold and the mainland is covered with snow and permanent ice-caps, with a general interior elevation of 5000 to 11,000 feet. The population numbers some 10,000 of which the greater part are Eskimos. The principal settlements are: Julianshaab, to the north-west of Cape Farewell; and Upernivik at the southern end of Melville bay, in latitude 72° 50′N., which is the most northern Danish settlement. Greenland with the exception of the Cape York region is accredited as belonging to Denemark, although they actually only occupy some 45000 square miles, on the southern and western coasts.

Miocene Plant beds.—"One of the most remarkable geological discoveries of recent times has been that of the Miocene plant beds in North Greenland. Heer has described a flora extending at least up to 70° N., containing 137 species, of which 45 are found also in the Central European Miocene basins, More than half of the plants are trees, including 30 species of conifers (Sequioia, Thujopsis, Salisburia, etc.) besides beeches, oaks, planes, poplars, maples, walnuts, limes, magnolias and many more. These plants grew on the spot, for their fruits in various stages of growth have been obtained from the beds. From Spitzbergen (78° 56′N. Lat.) 136 species of fossils plants have been named by Herr. But the latest English Arctic Expedition (Nares-Ellesmere Land) brought to light a bed of coal black and lustrious like one of the Palaezoic fuels, from 81° 45′ lat. It is from 25 to 30 feet thick and is covered by black shales and sandstones, full of land plants. Heer notices 26 species, 18 of which had already been found in the Arctic Miocene zone. As in Spitzbergen, the conifers are most numerous (pines, firs, spruces and cypresses) but there occur also the arctic poplar, two species of birch, two of hazel an elm and a virburnum. In addition to their terrestrial trees and shrubs the stagnant waters of the time bore water-lilies, while their banks were clothed with reeds and sedges. When we remember that this vegetation grew luxuriantly within 8° 15′ of the North Pole, in a region which is now in darkness for half of the year, and is almost continuously buried under snow and ice, we can realize the difficulty of the problem in the distribution of climate which these facts present to the geologist" (Encyclopedia Britannica).

Baffin und Bylot.—In 1615. See page 297.

Baffiin.—In 1616. See page 298.

Jens Munck.—In 1616. See page 298.

Luke Fox.—In 1631. See page 298.

Captain James.—In 1631. See page 299.

Henry Kelsey.—In 1691. See page 302.

Captain James Knight.—In 1719. See 302.

Captain Meddleton.—In 1741. See page 303.

Arthur Dobbs.—In 1746. See page 303.

Captain Christopher.—In 1761. See page 304.

Samuel Hearne.—In 1770. See page 304.

Phipps.—Hudson's record of "farthest north" when he reached latitude 80° 23' in the neighbourhood of Spritzbergen remained unequalled for 165 years, or until 1773, when J. C. Phipps surpassed it by 25 miles. The most interesting fact connected with the Phipps expedition is that Nelson, the Hero of Copenhagen, Trafulgar and the Battle of the Nile, then a lad of fifteen, was a member of the party. Thus the boldest and strongest spirits of the most adventurous and hardy profession of those days sought employment in the contest against the frozen elements of the north.

Cook.—In 1776 Captain James Cook (accompanied by Captain James Clerke) who had already made two voyages round

Iceberg from Greenland Coast.

the world, attempted to discover the North-west passage by Behring's strait which he entered in August 1779 and penetrated to a point which he named Icy Cape, in latitude 70° 29'N., and longitude 198° 20'W., where he found the ice impenetrable being a solid mass ten feet thick and extending across to the coast of Asia, and aground in 27 fathoms. He returned to the Sandwich islands and, there, lost his life in a skirmish with the natives.

Pickersgill.—Lieut. Piçkersgill was sent out in 1776 in the brig Lion, to meet Captain Cook by Baffin's Bay. He reached latitude 68° 10'N., and then bore away for Labrador, returning unsuccessful.

Clerke and King.—In 1780 Captains Clerke and King made another unsuccessful attempt by way of Behring strait; but the furthest point to which they proceeded was latitude 70° 33'N. in longitude 194°W.

Mackenzie.— In 1789, a young Scotchman, Alexander Mackenzie, who had been engaged for some years in the Canadian Fur Trade, journeyed with a party of Indians and Canadians voyageurs in canoes from Montreal to the Mackenzie River, which vast river he traced to its mouth at the Polar sea for the first time and to which he gave his name as well as to the vast country which it drains. In 1793 Mackenzie made a similar exploration of the Peace river. He embodied his experiences in 1801 in a volume entitled "Voyage from Montreal on the River St. Lawrence through the Continent of North America to the Frozen and pacific Oceans in the years 1789 and 1793 with a preliminary account of the rise, progress and present state of the Fur Trade of that country", illustrated with maps and dedicated to His Most Sacred Majesty, George III.

In the preface Mackenzie writes:—"I was led, at an early period of life, by commercial views, to the country North-west of Lake Superior, in North America and being endowed by Nature with an inquisitive mind and enterprising spirit; possessing also a constitution and frame of body equal to the most arduous undertakings, and being familiar with toilsome exertions in the prosecution of mercantile pursuits, I not only contemplated the practicability of penetrating across the continent of America, but was confident in the qualifications as I was animated by the desire to undertake the perilous enterprize."

"The general utility of such a discovery has been universally acknowledged, while the wishes of my particular friends and commercial associates that I should proceed in the pursuit of it, contibuted to quicken the execution of this favourite project of my own ambition; and as the completion of it extends the boundaries of geographic science, and adds new countries to the realms of British commerce, the dangers I have encountered, and the toils I have suffered, have found their recompense; nor will the many tedious and weary days, or the gloomy and inclement nights which I have passed, have been passed in vain."

"The first voyage has settled the dubious point of a practical North-west passage; and I trust that it has set that long agitated question at rest, and extinguished the disputes respecting it for ever."

"In this voyage, I was not only without the necessary books and instruments, but also felt myself deficient in the sciences of astronomy and navigation: I did not hesitate, therefore, to undertake a winter's voyage to this country (England), in order to procure the one and acquire the other, These objects being accomplished, I returned, to determine the practicability of a commercial communication through the continent of North America, between the Atlantic and Pacific oceans, which is proved by my second journal, nor do I hesitate to declare my decided opinion, that very great and essential advantages may be derived by extending our trade from one sea to the other."

Mackenzie suggested:—"A line of communication and trading posts between the Columbian river (which was reported by the explorer, Vancouver, to be the most northern situation fit for colonization and suitable for the residence of a civilized people) on the west, and the Nelson River flowing into Hudson Bay on the east."

"By opening the intercourse between the Atlantic and Pacific Oceans, and forming regular establishments through the interior, and at both entrances, as well as along the coasts and islands, the entire fur trade of North America might be obtained from the latitude 48° north to the Pole, except that portion of it which the Russians have in the Pacific. To this may be added the fishing in both seas, and the markets of the four quarters of the globe. Such would be the field for commercial enterprize, and incalculable would be the produce of it, when supported by the operations of that credit and capital which Great Britain so eminently possesses. Then would this country begin to be remunerated for the expenses it has sustained in discovering and surveying the coasts of the Pacific ocean, which is at present left to America advanturers, who without regularity or capital or the desire of conciliating future confidence, look altogether to the interest of the moment. They, therefore, collect all the skins they can procure, and in any manner that suits them. and having exchanged them at Canton for the produce of China, return to their own country. Such adventurers, and many of them, as I have been informed, have been very successful, would instantly disappear from before a well-regulated trade."

"These voyages will not, I fear, afford the variety that may be expected from them; and that which they afford to the eye, is not of a nature to be effectually transferred to the page. Mountains and vallies, the dreary waste, and wide-spreading forests, the lakes and rivers succeed each other in general description. The beaver and buffalo, the moose-deer and the elk, which are the principal animals to be found in the countries, are already familiar to be inhabitants of Europe, and have been so often as well as correctly described in their works. that the bare mention of them, as they enlivened the landscape, as they were hunted for food; with a cursory account of the soil, the course and navigation of lakes and rivers, and their various produce, is all that can be reasonably expected from me."

"I do not possess the science of the naturalist; and even if the qualification of that character had been attained by me, the curious spirit would not have been gratified. I did not stop to dig into the earth, over whose surface I was compelled to pass with rapid steps; nor could I turn aside to collect the plants which nature may have scattered on the way, when my thought anxiously employed in making provision for the day was passing over me. I had to encounter perils by land and perils by water; to watch the savage who was my guide, or to guard against those of his tribe who might meditate our destruction. I had, also, the passions and fears of others to control and subdue. Today I had to assuage the rising discontent, and on the morrow to cheer the failing spirits of the people who accompanied me. The toil of our navigation was incessant and oftentimes extreme; and in our progress over land we had no protection from the severity of the elements, and possesed no accommodations or conveniences but such as could be contained in the burden on our shoulders, which aggravated the toil of our march, and added to the wearisomeness of our "way".

"Though the events which compose my journals may have little in themselves to strike the imagination of those who love to be astonished or to gratify the curiosity of such as are enamoured of romantic adventures, nevertheless, when it is considered that I explored those waters which had never before borne any other vessel than the conoe of the savage; and traversed those deserts where an European had never before presented himself to the eyes of the swarthy natives; when to these considerations are added the important objects which were pursued, with the dangers that were encountered, and the difficulties that were surmounted to attain them, this work will, I flatter myself, be found to excite an interest, and conciliate regard in the minds of those who peruse it."

In 1806, William Scoresby, Sr. reached by ship latutude 81–30'N., Long. 19'E. which was a record until Parry eclipsed it.

Captain Scoresby was aided by Sir John Barrow, secretary to the Admiralty, who, by his writings and personal influence, induced the British Government to again undertake a series of Arctic explorations.

Kotzebue.—In 1815-1818, Lieutenant Kotzebue of the Russian Navy, in a vessel named the Rurik, fitted out at the expense of the Russian Count Romanzoff, proceeded round Cape Horn and attempted the discovery of the North-west passage by way of Bhering Strait. This he passed and entered the sea which bounds the northern shore of the American Continent. Kotzebue discovered the sound which bears his name, and which had been passed un-noticed by Captain Cook. He returned unsuccessful as far as even the slightest attempt at a passage was concerned and did not succeed in reaching Icy Cape.

Scoresby.—The wars with the American colonies and with France occupied the undivided attention of the British nation until the final fall of Napoleon, and during this period nothing was done to further the renewal of the search for a north-west passage, until 1817, when Captain Scoresby published an account of the great disruption of ice in the Greenland seas, and pointed to the case with which explorations might then be carried on in the Arctics.

Ross and Parry.—Two ships, were equipped for wintering in the north, were fitted out to explore the regions westward of Davis strait. The Isabella commanded by Captain John Ross, and the Alexander, by Lieutenant William Edward Parry, were selected for this undertaking. They sailed on the third of May, 1817, and were first stopped by the ice just north of Disko island on the 17th of June. Melville bay was crossed with some difficulty, and a delay of a week occurred near Cape York. At midnight on the nineteenth of August, the Isabella was in latitude 76° 54'N., with the Cary islands bearing southeast; this was the most notherly point reached. Ross considered Smith sound a closed bay, and named the capes forming each side of it Isabella and Alexander, after the ships. He stated that the sound probably extended eighteen leagues; sailing down the western side, the mouths of Jones and Lancaster sounds, both free from ice, but Ross did not enter them.

He described Lancaster sound as closed by the Crocker mountains. The expedition returned to England in october, having accomplished practically nothing beyond confirming the statements of Baffin made many years ago.

Parry and Liddon.—The report of Ross was not thought conclusive by the Admiralty, and in 1819 the Hecla and Griper were commissioned to explore Lancaster sound. Lieutenant Parry was given command in the Hecla, with Lieutenant Mathew Lidden in the Griper. The ships, without much difficulty, reached the mouth of Lancaster sound, continued westward past Regent inlet in the south,and Wellington channel and Byan Martin channal on the north, reached the south side of Melville island, where the winter was safely passed by the both ships in a small cove called winter harbour. The following summer an attempt was made to penetrate the heavy arctic ice which forms an almost perpetual barrier across the strait between Melville island and Banks island; this proving impossible, the expedition returned safely to England in October 1820. Parry in his voyage passed over nearly half the distance between the Atlantic and Pacific, and saw from his farthest western point the shores of Banks island beyond the middle of that distance. He laid down, on the north of his track the chain of islands bearing the names of North Devon, Cornwallis Bathurst and Melville; and on the south, North Somerset, Cape Walker and Banks.

On September 15th 1908 Capt Bernier and a party from the Canadian ship "Arctic", found a record which had been left by Parry in 1820 in a cairn on Table hill. The Cairn was about eight miles distant from Winter harbour, and was on the south-west corner of Table hill. The document was of parchment, and contained a record of an attempt to discover the north-west passage, and describes the entrance of the Hecla and Griper (the former ship commanded by Parry and the latter by Lieut Liddon) into Lancaster sound and a continuation westward through Barrow strait. Barrow strait was named by Parry after Mr. Barrow, Secretary of the Admiralty. Nine islands were discovered and named New Georgia and the North Georgia islands, in honor of King George the III. The record stated further that Lancaster and Barrow straits were found to give an entrance from Baffin bay into the Polar sea. This parchment was signed W. E. Parry and Mathew Liddon and was in an excellent state of preservation.

From Table hill the Arctic's party gained a splendid view extending as far as Liddon gulf, about twenty miles distant; the country being rather flat but undulating, with the exception of a ridge which ran north-westward from Cape Bounty. On

Table hill a record was left by Mr W. A. Jackson, the meteorologist of the expedition in place of Parry's record.

Parry and Liddon explored Melville island during the spring of 1820 and brought home very detailed accounts and samples of the geology, minerals, flora and fauna of that island. The British Parliament had offered a prize of £5000 to the first navigator who passed the 110th meridian west Greenwich; and this Parry and his companions received and they named Cape Bounty on the south coast of Melville island in commemoration of the feat.

Magnetic Pole.—Parry was also the first navigator to pass directly north of the magnitic North Pole, which he located approximately and thus was the first to report the strange experience of seeing the compass needle pointing to the south. He also has the distinction of being the only navigator who ever succeeded in reaching Melville island by vessels propelled only by sail-power and of bringing them back safely through the terrible ice-floes that block Barrow strait.

So great was Parry's success that the British Government sent him out in command of two other expeditions in search of the North-west passage.

Franklin.—During the time that Parry was making his important discoveries by sea, Lieutenant John Franklin was employed in tracing the northern shores of the American continent. From 1819 to 1822 Franklin was engaged in leading an expedition overland from Hudson bay to the Arctic shores, in the vicinity of the Coppermine river. The British Admiralty, who planned the expedition, knew practically nothing about the conditions for travel through the regions it purposed exploring, and depended for aid solely upon the Hudson's Bay Company. Unfortunately at this time the quarrel between the Hudson's Bay Company and the North-west Company was at its height, and the resources of both were consequently crippled. The North West Company was far stronger in the Mackenzie river valley, and their rivals, the Hudson's Bay Company, who were to help Franklin, were unable to give him efficient aid, or to supply him with a large stock of provisions; in consequence, he started from the outposts with almost no food, determining to trust to his hunters for the provisions required for his party. This finally led to disaster, and on the retreat from the Arctic sea, over one half of the party, including Lieutenant Hood, died of starvation.

Franklin left England in the Hudson's Bay Company's ship, accompanied by Lieutenants Back and Hood, Dr Richardson and one seaman. They arrived at York Factory, at the mouth of the Hayes River on the west coast of Hudson bay, where they met four of the leading partners of the North-west Company, who were held prisoners by their rivals. As the men had spent a number of years in the Mackenzie river country, Franklin obtained much valuable information from them. After a few days at York, the party proceeded by canoes from there, 650 miles to Cumberland House, on the Saskatchewan river, where the first winter was passed.

The following summer (1820) the party reenforced by a number of Canadian voyageurs, started northward in canoes, and reached Fort Chipewyan, on Great Slave lake, before the ice had melted. The expedition, now consisting of 25 persons, started away from Fort Chipewyan with one day's supply of provisions and a totally inadequate amount of ammunition. Travelling to the north side of the lake, the party was further increased by a band of Copper Indians, and all journeyed to Fort Enterprise, which was built near the edge of the barren lands, in latitude 64° 30'N. The total distance travelled during this season was, 1,350 miles.

Venison was plentiful during the winter (1820-21) but the supply failed in the spring, so that a start was made over the barrens without any food except such as fell to the hunters from day to day. The distance from Port Enterprise to the mouth of the Coppermine River is 334 miles. The first 120 miles were made by tramping with canoes and outfit over the snow; the remainder was made in canoes and the mouth of the river was reached on the 21st of July. Turning eastward, the shores of Bathurst inlet and Coronation gulf were surveyed to Point Turnagain, in latitude 68° 19'N. and longitude 109° 25'W. The canoes were detained here several days by a snowstorm, and a retreat was necessary as soon as the weather moderated. The course along the coast was therefore retraced to Hodd river, and that stream was ascended for a short distance. The equipment was reduced to the smallest compass, and a course was shaped overland for Fort Enterprise, the travelling being through deep snow. Game was very scarce, and the hardships soon began to tell on the weaker members of the party, with the result, as before stated, that half the number, including Lieutenant Hood succumbed to cold and starvation.

The survivors were secoured by Indians on the 7th of November, 1821, and reached the Hudson's Bay post on Great Slave Lake on the 11th of December, and England in October 1822.

Parry and Lyon.—In 1821, Sir W. E. Parry made his third voyage to the Arctic islands, in command of the Fury having as second in command, Captain G. F. Lyon, in the Hecla. This time the attempt was made through the Hudson strait and up Fox channel. The first season he examined Repulse bay and went into winter quarters at Winter island, a few miles beyond the eastern entrance of the Frozen strait of Middleton, whose accuracy was proved after being long clouded by the reckless attacks of Dobbs. The ships were released from ice by the 28th of June, and no time was lost in pushing northward, until stopped by the heavy ice off the eastern mouth of Fury and Hecla strait, where the remainder of that season and the early part of the next were spent in trying to pass through the strait, the eastern part of which owing to the islands that are clustered in the narrow channel, remaining continuously blocked with heavy ice-floes.

Parry and his assistant charted the eastern shore of Melville peninsula, made soundings of Fox channel and Fury and Hecla strait, charted the coastline and brought home a very complete collection of geological specimens from the surrounding country.

Scoresby.—In 1822 Captain Wm. Scoresby, Jr. made a voyage to the east-coast of Greenland, upsetting all previously conceived ideas as to the nature of that coast and made a number of scientific observations.

Parry and Hoppner.—In 1824-25 Parry tried a forth time to make the north-west passage, by way of Regent inlet. He wintered at Port Bowen on the east side of the strait, but the attempt was determinated by the wreck of the Fury, commanded by Capt. Hoppner, the following spring near Cape Fury on the east coast of North Somerset. With great forethought, Parry caused all the provisions to be landed from the wreck and safely housed on Fury beach, where they were subsequently found by Ross, and were the means of rescuing his crew from starvation.

In explorations and discoveries, the result of these two later expeditions were not so rich, but the experience in ice work that they afforded suggested to Parry ideas that revolutionized all methods in arctic navigation.

Captain Lyon.—In 1824. See page 307.

Franklin,—In 1825-27, Captain Sir John Franklin, resumed his exploration of the Arctic coasts of America in much happier circumstances. The rival for companies had now amalgamated forming one powerful company, with full control over the natives and capable of rendering valuable assistance to an exploring party in the far north.

Franklin profiting by his former sad experience, had a large supply of pemmican prepared in advance, and stored at Fort Chipewyan. The journey from England was made by way of Montreal and the Great Lakes.

After passing a winter at Great Bear lake, Franklin descended the Mackenzie to its mouth, and then surveyed the coast westward to return reef, passing the northern end of the Rocky mountains, leaving only 160 miles of unsurveyed coast between his farthest point and Point Barrow, reached the same year by Captain Beechey in boats from Bering straits.

Richardson and Kingdall.—While Franklin was thus engaged with one-half of his party, the other half, under the command of Dr. Richardson and Lieutenant Kendall, were exploring the coast between the mouth of the Mackenzie and Coppermine rivers. These surveys carried the exploration from Bering strait to Coronation gulf, with only a break of 160 miles between Return reef and Point Barrow, or through 60 degrees of longitude. The easthern end of these surveys was overlapped six degrees in longitude by the discoveries of Parry to the northward, and only a channel running north and south was required to connect them, and so complete the long sought northwest passage.

Parry.—Hitherto all attempts to approach the Pole had been in ships. In 1827 Parry suggested the plan of a dash to the Pole on foot, from a base on land. He obtained the assistance of the Government, which for the fifth time sent him to the Arctic provided with well equipped ships and able officers and men. He carried a number of reindeer with him, to his base in Spitzbergen, purposing to use these animals to drag his sledges. The scheme proved impracticable however, he was compelled to depend on the muscles of his men to handle his two heavy sledges, which were in reality boats on steel runners. Leaving Spitzbergen on June 23rd with 28 men, he pushed northward. But summer sun had broken up the ice-floes, and the party repeatedly found it necessary to take the runners off their boats in order to ferry across the stretches of open water. After thirty days of incessant toil Parry had reached 82° 45′, about 150 miles north of his base and 435 geographical miles from the Pole. Here he found that, while his party rested, the drifts of the ice was carrying him daily back, almost as much as they were able to make in a day's work. Retreat was therefore made to the ship and he returned to England.

Parry's exploits, which marked a new era in Polar explorations, created a tremendous sensation. Knighthood was immediately bestowed upon him by the King, while the British people heaped upon him all the honours and applause with which they crowned every explorer returning from the north with even a measure of success. In originality of plan and equipment Parry has only been equaled by Nansen and Peary.

John Ross.—In 1829, Captain John Ross, being anxious to remove the reproach of his former failure, and having been provided by Sir Felix Booth, with a well-fitted paddle-wheel steamer.the Victory, of 150 tons, sailed from the Thames with the intention of seeking a passage through Regent inlet. He was assisted as mate, by his nephew, James Clark Ross, who was young and energetic and who was later to win laurels at the opposite end of the globe. This was the first attempts to use steam for ice-navigation, and although if failed to achieve a north-west passage the Rosses brought back very valuable information as a result of their voyage.

The ship was beset fast in the ice, and finally abandoned in Victoria harbour, on the west side of the gulf of Boothia, nearly opposite Fury and Hecla strait. The expedition was remarkable for the number of winters spent in the Arctic circle, three of them on the Victory and the fourth at Fury beach, where the provisions that had been throughfully housed by Parry were the means of saving the crew from starvation.

J. C. Ross.—The chief discoveries were made by Lieutenant James Clark Ross who by several long sled journeys traced a part of the shores of King William island, and of the west side of the peninsula of Boothia, up to the Magnetic Pole; also the shores of Lord Mayors bay and its vicinity in the gulf of Boothia. During the retreat to Fury beach, Brentford bay was crossed several times without notice being taken of Bellot strait.

During their five year's absence, 1829-34, they made important discoveries around Boothia Felix, but most valuable was their definite location of the Magnetic North Pole, and the remarkable series of magnetic and meteorological observations which they brought back with them.

Sir John Ross in his "Narrative of a Second Voyage in Search of a North-west Passage and of a residence in the Arctic Regions during the years 1829, 1830, 1831, 1832 and 1833 and the Discovery of the Northern Magnetic Pole", published in London in 1835 writes: "It is a remarkable circumstance that the means of all the latitudes and longtitudes of Melville island, Igloolik, Winter island and Port Bowen, give nearly the actual situation of the Victory at Felix Harbour, while the temperature of these four positions; indicating thereby a gradual relation of temperatures, which is at variance with a popular theory on that subject. "He found the tides at Felix Harbour very irregular-the extreme rise being nearly six feet. On the morning of March 7th., the tide rose one foot eight inches, and in the evening five foot three inches. Salmon, caribou, musk-ox, seal, bear and wolverene were plentiful on Boothia Peninsula, and also Eskimos. Felix Harbour is in latitude 69° 58′ 42″ 5N., and longitude 92° 1′ 6″6 W. Victory Harbour is in latitude, 70° 9′ 18″N and longtitude 91° 30′ 35″ W., and the Magnetite Variation was 101° 32′ 03″ westerly.

They left Fury Beach on July 8th 1833 and after traveling in three boats to Batty Bay, 62 miles further north, crossed Regent Inlet in clear water on July 17th and on the 25th were picked up by H. M. S. Isabella in Navy Board inlet. The results of the expedition were the discovery of the Gulf of Boothia, the continent and isthmus of Boothia Felix and a vast number of islands, rivers and lakes, and the establishment that the north-east point of America extends to the 74th degree of latitude. The expedition also located and named after King William the Fourth of England the Northern Magnetic Pole.

Back.—Considerable anxiety was felt in England, after two winters had passed without any tidings of the Victory and Captain Back was oufittted by public subscription to descend the Great Fish river to its mouth, and there if possible, with the help of natives, succour the crew of the Victory. Back spent the winter of 1834 at Great Slave lake, and the following summer crossed the height-of-land and descended Great Fish river to its mouth in a heavy boat. Having been informed, by an express from England, of the safe return of Ross, he confined himself to geographical work, and traced the estuary of the river to Cape Britannia on the one side and to Point Richardson on the other, being only a short distance between his northern termination and the southern point of James Clark Ross' southern sled journey. The result of Back's journey left only 160 miles to the west of the Mackenzie, and thirtheen degrees of longitude between Franklin's Point Turnagain and the Gulf of Boothia to complete the northwest passage.

Captain Back.—In 1836. Sec page 307.

Dease and Simpson.—The Hudson's Bay Company undertook to fill the gaps of unsurveyed coast-line left by the Rosses and Sir John Franklin and sent an expedition under the direction of Peter Warren Dease and Thomas Simpson, an expert surveyor. The western section was first completed in 1837.

In 1838-39 the eastern portion between Point Turnagain and the estuary of the Great Fish river was surveyed by the same intrepid explorers, without any loss of life to their party, and without other hardships than those incidental to travel in the Arctic. The boat voyages—by which these surveys were completed were the longest ever undertaken in arctic waters, and embraced sixty-two degrees of longitude between Point Barrow and Castor and Pollux river, the most eastern point of Simpson. While surveying the coast to the eastward, Simpson charted the south side of Victoria island and the south side of King William island.

Unfortunately the advanced state of the season would not permit Simpson to connect the mouth of the Great Fish river with Regent inlet, or with King William sea. This the Hudson's Bay Company resolved to complete, and selected Dr. John Rae for the work.

Maury.—There is a great branch of physical geography which has only been effectively studied within the last seventy years, namely the physical geography of the sea. Mathew Fontaine Maury, an American in charge of the Washington Observatory in 1842 by his wind and current charts, by his trade, wind, storm, rain and whale charts and above all by his charming work "The Physical Geography of the Sea", gave the first impulse to this study. It was Captain Maury who organised the first deep-sea soundings in the North-Atlantic, which up to that time was deemed to be unfathomable; and when his work was published the illustrious Humboldt declared Maury to be the founder of a new and important science the meteorology of the sea.

Dr. Rae.—In 1845. See page 307.

The Search for Franklin

Franklin and Crozier.—In 1845 the British Government fitted out the Erebus and Terror with provisions for three years, and with the most approved system of heating and ventilating, and other means of preserving the health and comfort of the crew. The command of the expedition was given to Sir John Franklin, with Captain Crozier, of the Terror, second in command. The other officers wers carefully selected from among the most promising and energetic of the junior officiers of the navy, while the seamen and the petty officers were also the best in the navy.

The crews leaving England amounted to 134 persons, of whom five were sent home from Greenland, leaving a total of 129 on board the ship, when they entered Lancaster sound, and were seen for the last time.

No band of men ever set out for the unknown with brighter hopes or with more just anticipation of success than Sii John Franklin's expedition of 1845. The frightful tragedy which overhelmed them, together with the mystery of their dissappearance, which baffled the world for years and is not yet entirely explained, forms the most terrible narrative in arctic history.

Franklin had been Knighted in 1827, at the same time as Parry for the value and very extensive explorations which he had conducted by snowshoes and canœ on the North American coast between the Coppermine, the Mackenzie and Great Fish rivers, during the same years that Parry had been gaining fame in the north. In the interval Franklin had served as Governor of Tasmania for seven years, His splendid reputation and ability as an organizer made him, though now 59 years of age, the unanimous choice of the Government for the most elaborate expedition it had prepared in many years. Franklin's fame and experience, and that of Crozier and his other Lieutenants, who had seen much service in the north, his able ships the Terror and the Erebus, which had just returned from a voyage of unusual success in the Antartic, and his magnificent equipment, aroused the enthousiasm of the British to the highest pitch and justified them in their hopes of bringing the wearying struggle for the North-west Passage to an immediate conclusion.

For more than a year everything prospered with the party. Franklin's instructions were to enter Lancaster sound, and, when in the vicinity of Cape Walker to penetrate to the southward and westward in a course as direct as possible to Bering strait. A quick passage appears to have been made through Lancaster sound to Wellington channel, up which the ships sailed to the seventy-seventh parallel, and then down again on the west side of Cornwallis island, returning eastward to winter at Beechey island (Erebus bay). Many traces of a winter residence were found there, including sites of workshops, forge and observatory. Over 700 empty meat cans, all labelled "Goldner's Patent" were found pilled in regular mounds. A large quantity of similar tins supplied to the navy had been found to be putrid, and were condemned. This had probably happened to the tins left at Beechey island, and helped to hasten the starvation of the unfortunate crews two winters later. Three seamen died during the first winter, and were buried on the island.

By September, 1846, Franklin had navigated almost within sight of the coast which he had explored 20 years previously, and beyond which the route to Bering sea was well known. The prize was nearly won when the ship became imprisoned by the ice for the winter in Victoria strait, a few miles north-west of King William island.

Record of Disaster.—The next information concerning the fate of Franklin was obtained from a brief record, found on King William island by M'Clintock, in 1859. The record is as follows: "Lieutenant Graham Gore and Mr. Charles F. des Vœux, mate, left the ships on Monday, the 24th of May, 1847, with six men, (to deposit papers on King William's island) H. M. ships Erebus and Terror wintered in the ice in latitude 74° 5'N., longitude 98° 23'W. Having wintered in 1845-46 at Beechey island in latitude 74° 43' 28"N., longitude 91° 31' 15"W. After having ascended Wellington channel to latitude 77°, returned by the west side of Cornwallis island, (Sir) John Franklin commanding the expedition. All well."

This was the original record, and on the 25th of April, 1848, after passing another winter in the ice, a most mounful addition was made to it. The addition read as follows. "(I) 848. H. M. ship Terror and Erebus were deserted on the 22nd April, 5 leagues N. N. W. of this— having been beset since 12th September, 1846. The Officers and crew consisting of 105 souls under the command of Captain F. R. M. Crozier landed here in lat. 69° 37' 42", long 98° 41'. (*This*) paper was found by Lt. Irving under the cairn supposed to have been built by Sir James Ross in 1831, four miles to the northward, where it had been deposited by the late Commander Gore in June, 1847. Sir James Ross pillar has not, however, been found, and the paper has been transfered to this position which is that in which Sir J. Ross pillar was erected. Sir John Franklin died on the 11th June, 1847, and the total loss by deaths in the expedition has been to this date 9 officers and 15 men. F. R. M. Crozier, Captain and Senior Offr., and start on tomorrow 26th, for Back's Fish river. James Fitzjames, Captain H. M. S. Erebus".

The Fate of Franklin's Expedition.—The rest of the sad story may shortly be told: the distance to mouth of the Fish river, from the spot where the ships were abandoned, is about 250 miles. They started from the ships dragging heavy boats on sleds. In 1859 M'Clintock found one of the boats on the west side of King William island with two skeletons inside, and clothing and chocolate. He also found among the Eskimos silver plates and other relics of the party; in another place he found tents and flags; and elsewhere he made the yet more ghastly discovery of a bleached human skeleton, proof on its face, as though attesting the truthfulness of an Eskimo woman who, claiming to have seen forty of the survivors late in 1848, said "they fell down and died as they walked".

The Eskimos living at the mouth of the Fish river said that about 40 white men reached the mouth of the river, and dragged a boat as far as Montreal island in the estuary, where the natives found it and broke it up. The last of the survivors died shortly after the arrival of the summer birds. It is exceedingly doubtful, if their strength had lasted, whether they could have travelled over the thousand miles of barrens separating the mouth of the river from the nearest trading post on Great Slave lake but at least a trial would have been made.

It is quite possible, however, that half of the party headed for Coronation Gulf and the Coppermine river in the hopes of winning their way back by Franklin's old route.

Search Expeditions.—The fate of the expedition remained for a number of years unknown, although the British government spared no expense in the attempt to rescue the unfortunate crews, and, when the hope of succouring was gone, in a search for proof of their fate. Official relief expeditions were supplemented by others under private auspices, due either to Lady Franklin or to her appeals to the sympathy of the public for convincing evidence as to the terrible fate of her unfortunate husband and his companions. America joined forces with England in the attempts to rescue the expeditions, and sent out a number of ships to act in conjunction with the others, while France sent two gallent officers, one of whom, Lieutenant Bellot, lost his life while engaged in this work. As the conditions under which the searches were made were exceedingly difficult and hazardous, much time and energy were spent, and many risked and lost their lives.

Twelve years passed before M'Clintock discovered undoubted proofs of the complete loss of the ships and the death of the entire crews. During this time thirty-five ships and five overland expeditions carried a host of eager searchers to the Arctic, where incidental to their main object of rescuing the crews of the Erebus and Terror, they explored the entire coastline of America and the shores of the Arctic islands, with such minute care as only their mission would warrant.

To these search expeditions an intimate knowledge of Arctic America is largely due, and when the search was finished only the most northern islands remained for future explorer. As sometimes happens, the brave but unfortunate Franklin and his equally brave and enduring companions in disaster accomplished more for human knowledge by their pitiful fate than if they had successfully accomplished the object of their undertaking.

The following is a brief account of the numerous search expeditions, and a brief summary of the geographical work accomplished by them.

Dr. Rae.—Meanwhile, when Franklin failed to return in 1848—he was provisioned for only three years—England became alarmed and dispatched relief expeditions by sea from the Bering sea and the Atlantic and by land north from Canada, but all efforts failed to gather news of Franklin till 1854, when Rae fell in with some Eskimos hunters on the east side of King William island who told him of two ships that were beset some years previous and of the death of the party from starvation. Dr. Rae thus was the first to bring back intelligence of the loss of the Erebus and Terror, and of all their crews.

Sounders.—1848-49—James Saunders, Master of H. M. S. North Star to Wolstenholme sound and Ponds inlet.

Moore and Kellet.—1848-50—Captian Thomas Moore, of H. M. S. Plover, and Captain Henry Kellet, of H. M. S. Herald and Robert Dhedden, in yatch Nancy Dawson, to Bering sea.

Goodsir.—1849—Dr. R. A. Goodsir, in the Advice whaler to baffin bay.

Pullen.—1849—Lieutenant W. J. S. Pullen, of H. M. S. Herald boat voyage from Bering strait to the Mackenzie.

U. S. Parties.—1850-51—Lieutenant De Haven, of United States navy, in the Advance; S. P. Griffin, of the United States navy in the Rescue; Captain Horatic Austin, of H. M. S. Resolute; Captain Ommaney, of H. M. S. Assistance; William Penny, Master of the Lady Franklin, under Admiralty orders; Alexander Stewart, Master of the Sophia, under Admiralty orders; Rear-Admiral Sir John Ross, in the Felix yacht fitted at the expense of the Hudson's Bay Company, all to Lancaster Sound.

1850—Captain C. E. Forsyth, R. N., commanding the Prince Albert, belonging to Lady Franklin, to Regent inlet.

McClure.—1850-54—Captain Robert McClure, of H. M. S. Investigator, to Bering strait, Banks island and Lancaster sound. McClure had begun his search for Franklin in company with Commander Collinson who was his superior officer, from London in 1850, and passed through Magellan strait, afterwards calling at Honolulu where he and Collinson procured stores. The two vessels became separated, the Investigator outsailing the Enterprise, or rather sailing a different course, McClure made Bering strait first, and continued his voyage without waiting for Collinson, although he had been advised by Captain Kellet who was then in the same waters to wait. The Investigator was several days in advance on the Enterprise, and her course northeastward was continued until Banks island was sighted and the coast followed in search of Franklin around the northwestern end, and party down Prince of Whales strait between Banks island and Victoria island. The Investigator wintered in the strait of Princess Royal islands, in lat. 72° 50'N., long. 117° 35', during the winter of 1850-51. After the liberation of the ship, the next summer the southern end of Banks island was rounded, and the Investigator passed north again until Bay of Mercy was reached, on the south side of McClure strait between Banks and Melville islands, from which harbour the vessel never emerged unless she has drifted out since her abandonment in 1853.

McClure with sledge parties crossed the strait named after him to Winter harbour on Melville harbour, and there left records on Parry's rock with the hope that Sir John Franklin might become acquainted with the fact that the Investigator was fast in Bay of Mercy. These records were found by Captain Kellet after McClure had returned to his vessel, and Lieutenant Pin and Dr. Domville, of the Resolute, were sent by Kellet to communicate with McClure and apprise him of the fact that the Resolute was at Dealy island, a short distance from Winter harbour.

The papers found by the Canadian Ship Arctic, when she wintered at Melville island in 1908-09, in Kellett's depot at Dealy island contained a pathetic story of the weakened and debilated state of McClure's crew, immediately previous to the abandonment of the Investigator. Commander Kellet, who was at the time the superior in rank to McClure directed him to have an examination of the men made, and to call for volunteers who might be willing to remain another season on board the Investigator.

The medical officers reported that the men of the crew were in no condition to pass another rigorous season on board ship and any attempt to do so would be sure to meet with fatal results. The officers, the carpenter and four seamen, with great pluck volunteered to stand by the ship, but the number was not sufficient to man the vessel, therefore there was no other course for McClure than to abandon the Investigator; this he did with regret and left her to the charge of the ice and the winds. Before doing so, he caused, to be cached enough provisions for 66 men for four months, and anchored his vessel in a position that he supposed would allow her to be upon a shoal, where, he said, she would last for ages. He was mistaken, however, as no sign was visible of either the cache of the vessel when Officers Green and Morin of the Arctic visited Bay of Mercy in the spring 1909.

McClure and his men abandoned the ship in the spring 1854 and by walking over the ice of McClure, Melville, Barrow and Lancaster straits to Beechey island made the northern northwest passage on foot. Here they were rescued and taken home to England. A valuable meteorological table made by McClure when he wintered in Prince of Wales strait in 1850-51 was found in 1908-09 by the officers of the Canadian ship Arctic.

Collinson.—1850-55—Captain Richard Collinson, C. B., of H. M. S. Enterprise, to Bering strait, Banks island, and along the continental channel to Cambridge bay, in Victoria island near King William island.

Collinson, who had been given the chief command of the two vessels, Enterprise and Investigator, made his voyage through Bering sea and proceeded north to a higher latitude than any navigator in the western part of the Arctic ocean, reaching above 73° N. He made a circuitous course in search of Franklin, and also at the same time giving his attention to a search for McClure. Signs of the landing of the latter were observed upon the coasts of banks and Victoria islands, but when these ceased he shaped his course in a southeasterly direction along the coast and passed through Union and Dolphin straits, Coronation gulf and Dease strait, to a point in Victoria strait, within sight of the place where Sir John Franklin died, but did not know it. The exact spot where the lamented Franklin ended his expedition and his life was afterwards discovered by McClintock, and it was then made known, that Collison was near the object of his search. Collison wintered in Cambridge bay, 1852-53, and returned westward to Bering strait and sailed for Hong Kong, where he dispatched copies of documents to the Admiralty.

Krabbie and Mecham.—Krabbie and Mecham, who accompanied McClure, crossed McClure strait and part of Melville sound and found evidences of the landing of Collinson in April 1851, on the north end of Victoria island.

Rāe.—Dr. John Rae, employed by the Admiralty, descended the Coppermine river, and traced Victoria island up to the parrallel of the north end of King William island, in Victoria strait, in 1851.

Kennedy.—1851-52—William Kennedy, Master of the Prince

Albert, belonging to Lady Franklin, to Regent inlet, Bellot strait and Prince of Wales island. Kennedy wintered at Batty bay on the east coast of North Somerset and explored the coasts of North Somerset, Prince of Wales and Russell islands.

Inglefield.—1852—Captain Edward A. Inglefield, in the Isabel, Lady Franklin's vessel, to Lancaster sound.

Captain Inglefield left England, in the crews schooner Isabel, with the intention of searching the deep northern inlets of Baffin bay for traces of Franklin, and with the hope of reaching the open Polar sea through Smith sound. Cape Farewell was sighted on the 30th of July, and Cape York on the 21st of August where a number of natives were seen in the vicinity. At North Omenak native caches of meat and winter clothing were found. On the 26th Cape Alexander, the farthest point seen by Baffin, was passed with an open sea to the northward. On the 27th he reached latitude 78° 21'N., in Smith sound, 140 miles beyond any previous navigator. He was forced by a strong northerly gale and low temperature to retreat south, and on his way entered Jones sound, which he explored to latitude 76° 11'N. and longitude 84° 10'W., in the neighbourhood on Haven fiord. He then entered Lancaster sound, and visited Beechey island, after which, turning homeward, he did not cross the Arctic circle until the 12th of October.

Maguire.—1852-55—Captain Rockfort Maguire, of H. M. S. Plover to Bering strait.

McCormick.—1852—Dr. R. McCormick, a boat excursion to Wellington channel.

Belcher.—1852-54—Captain Sir Edward Belcher, C. B., of H. M. S. Assistance, to Wellington channel.

Captain Belcher was the senior officer of all the ships then in the Arctic searching for Franklin, including Kellet in the Resolute. McClintock in the Intrepid, Sherard Osborn in the Pioneer, McClure in the Investigator and Pullen in the North Star.

Belcher's ship, the Assistance and the Resolute, Intrepid, Pioneer and Investigator had all to be abandoned as they were hopelessly beset in the ice-flœs of Wellington channel and Barrow strait. All the crews of these five vessels were conveyed back to England in 1854 by the North Star, commanded by Captain Puller which was stationed as a rescue ship at Beechey island, North Devon.

The Assistance wintered in Wellington Channel near Grinnell

Peninsula and Osborn, Austin, Richards and Hamilton, under Belcher's orders, traced by means of sledge journeys the northern end of Grinnell Peninsula and of Cornwallis, Finlay and Melville islands. They made full reports of their journeys and observations of the geology, fossils, flora and fauna of the regions traversed and also of the meteorological conditions. tides and movements of the Polar ice.

Kellett.—1852-54—Captain Henry Kellett, C. B., of H. M. S. Resolute, to Lancaster sound, Melville and Banks islands.

Captain Henry Kellett had made a voyage to Bering strait previous to his joining the expedition of Captain Belcher, and had met McClure in the Arctic ocean on his way sailing northeast. Kellett reached Herald island in Bering strait on that voyage, and returned with his ship to the Pacific ocean and around cape Horn, succesfully reaching England.

This voyage with Captain Belcher to Lancaster sound, in the Resolute, was the beginning of the eventful period between 1852-54, in which Kellett was in charge of the western expedition already mentioned, in search of Franklin, comprising the waters in Barrow strait and of the Southwestern part of the Arctic archipelago, including Banks island and Victoria island south of the McClure strait.

This fine officer was well worthy of the confidence of the Admiralty, who placed him second in command of Belcher; he eclipsed his superior officer in his discoveries and executive ability and was most ably aided by the activity and sterling ability of McClintock. The hardships, adventures and experiences of Kellett, as well as the ships under him, are but a memory of the past, but his depots and cairns for the assistance and guidance of ships, are monuments of his forethought. His bravery was undoubted, and his refusal to abandon his ship unless a peremptory order was given by Capt. Belcher, furnishes proof of his decisive character as a sailor and dogged purpose to do his utmost, in the search for Franklin.

The records which he had gathered from others, as well as copies of his own orders, were carefully deposited in safe places for the assistance of other navigators, entertaining always the forlorn hope, that Franklin might find his way to Dealy island. The large depot on Dealy island was well arranged and the plans of stores prepared with infinite detail, show his thoroughness. He carefully noted the safest routes to the rendez-vous, the number of hours which his men should travel and rest and the food they should be supplied with; during his final days of command in the western division of the expedition he travelled six hundred miles on foot to the North Star, which conveyed him back to England in company with the crews of the five vessels abandoned by the order of Commander Belcher. Dealy island, 35 miles east of Winter harbour and south of the Entrance to Bridport inlet, Melville island was the winter station of H. M. Ships Resolute and Intrepid in 1852-53.

The Resolute's drift.—Kellett's ship, the Resolute and McClintock's ship, the Intrepid, were beset and abandon on the ice-flœs of Barrow strait in 1853. The Resolute was abandoned in April 1853, 20 miles off Cape Cockburn, drifted through Barrow strait and Lancaster sound, and was picked up in the following year by an American Whaler in Davis strait. This represents a drift of 1000 miles.

Soundings in Lancaster Strait.—Soundings showed that Lancaster sound was nowhere much deeper than 300 fathoms, and Barrow strait mostly under 100 fathoms in depth.

McClintock.—1852-54—Captain Francis Leopold McClintock, of of H. M. S. Intrepid, to Lancaster sound and Prince Arthur island.

Captain McClintock of the Intrepid, and second in command to Captain Kellett, early showed his great activity by making sledge journeys of a hazardous nature across Melville islands, from the locality in which the Resolute and Intrepid were frozen in near Dealy island. The tracings made by McClintock around the shores of Melville island and Prince Patrick island, on foot, added many hundreds of miles to the coastline of the territory surveyed under Belcher and Kellett. The cairns established by him, between 1852 and 1854 are mentioned in his reports to Captain Kellett, and copies of these were afterwards found on Dealy island by Capt Bernier of the Arctic in 1908-1909.

1852-54—Captain W. S. J. Pullen, of H. M. S. North Star, to Beechey island.

1853—William H. Fawckner, Master Breadalbane, Transport Beechey island; crushed in the ice and foundered.

Rae.—1853—Dr. John Rae, under Admiralty orders, by sled to Victoria island, and by boat voyage to Victoria strait.

Kane.—1853-55—Dr. Elisha Kent Kane, of the United States navy, to Smith Sound, Humboldt glavier and Grinnell land.

1853—Captain E. A. Inglefield, of H. M. S. Phœnix, and Lieutenant Elliot, of the store ship, Diligence, to Beechey island.

Anderson.—1855—Chief factor John Anderson, of the Hudson's Bay Company, canœ voyage down the Great Fish River to Montreal island and Point Ogle, procuring further relics of the Erebus and Terror.

McClintock.—1857-59—Captain F. L. McClintock, R. N., in the Fox, Lady Franklin's yatch, to Peel sound, Regent inlet, Bellot strait, King William island and Montreal island, bringing precise intelligence of the fate of the Erebus and Terror, and a short record of their proceedings. Lieutenant Hobson, under McClintock, was the man who found the document, which so tersely told the sad tale, of death of the brave man, whose fate awakened the greatest interest of any explorer of modern times and perhaps in all history.

Summery of Search.—The above list is taken from "The Polar Regions", by Sir John Richardson, Franklins's old comrade, and gives a very brief statement of the numerous expeditions sent out in search of these ill-fated ships. Lengthy records of most of these expeditions have been published, in which the trials and hardships undergone are recorded in a matter of fact way, without any attempt to excite sympathy, and all honour should be paid to the memory of these men, many of them volunteers, for the dangers they passed through in the endeavour to rescue their fellowmen from terrible death by starvation and cold in the inaccessible Arctics.

Many lost their own lives, while others drifted all winter in ships crushed between great flœs of arctic ice; others, again, travelled through the northern winter, with its short days and intensely cold nights, with only fireless tent to shield them from death in the howling storms which sweep the treeless regions; all did their duty, and were faithful unto death.

Coastline.—A summary made shortly after the search ended, gives the length of coastline examined by the various searching parties as follows: Sir James Ross, in 1849, explored 990 miles of coastline on the eastern side of the Peel strait, in Lancaster sound, and in Regent inlet; Captain Austin traced 6,087 miles; Sir Edward Belcher and Captain Kellett, 9,432 miles; Sir Robert McClure 2,350 miles; Captain Collinson on his voyage to Cambridge bay, and Dr. Rae on the same coasts, 1,030 miles, making in all, 21,500 miles of coastline examined, of which 5,780 miles were previously unknown. From this summary the search of the American expeditions is omitted, as well as those of Lady Franklin's private expeditions, all of which would add greatly to the total.

The cost.—Admiral Sir F. L. McClintock has estimated the amount of money expended by the British Government on Arctic research, including the Erebus and Terror, research, including the out-fitting of the Erebus and Terror at £272,000 and on the relief and search expeditions £675,000; to this must be added the money subscribed for private expeditions, amounting to £35,000. The expeditions fitted out in the United States, mostly by private subscriptions, cost over £250,000.00.

Resultant benefit.—Admiral McClintock has further estimated that the number of miles traversed by sled expeditions only, over ice and land is about 43000 miles. His views as regard the economic and scientific value of the Arctic explorations are as follows;—"The benefits, doubtless. have been very great, to whaling commerce it has opened up all to the north and west of Davis strait. The value of these fisheries alone amounts to many millions sterling into the pockets of English and American traders. The scientific results are very varied, and ample in about every department, and peculiarly so in magnetism, meteorology, the tides, geographical discoveries, geology, botany and zoology, as shown by the general advance in each branch. Upon naval impulse the influence has been truly great; we could man an expedition with English naval officers."

Franklin memorial.—A suitable memorial in honour of the brave Franklin and his men. in the shape of a marble slab, suitably inscribed, was left at Beechey island, North Devon, the last winter head-quarters of the expedition, by Lieutenant McClintock, R. N., who landed there from the Fox, in 1858.

The inscription reads as follows:—To the Memory of Franklin, Crozier, Fitzjames and all their gallant brother officers and faithful companions who have suffered and perished in the cause of science and the service of their country. This Tablet is erected near the spot where they passed their first Arctic winter, and whence they issued forth to conquer difficulties or TO DIE. It commemorates the grief of their admiring countrymen and friends, and the anguish, subdued by faith, of her who lost in the heroic leader of the expedition, the most devoted and affectionate of husbands. "And so He brought them into Heaven where they would be."

This stone had been entrusted to be affixed in its place to the officers and crew of the American expedition commanded by Lieut. H. T. Hartstein. who set out in search of Mr. Kane and his companions.

This expedition was unable to reach Beechey island in 1855 and left the tablet at Disko island, which was afterwards brought from

Disko to its present resting place by Captain McClintock in the Fox, when he commanded the final expedition in search of Sir John Franklin and his companions in 1858 under the command of Capt Bernier the officers and crew of the Canadian Government ship "Arctic" built a cement foundation for this tablet and set it up in an upright position against the cenotaph in September 1906. They also raised the yatch Mary, that had been left on this island, Union Bay, by Sir John Ross, in 1852. They placed this yatch so that it can not be destroyed by the sea, and could serve in case of any ship wreck in the vicinity. On the barren plain, a few hundred yards from the ruins of the ancient house, are four graves marked by small wooden crosses, the last resting place of two of Franklin's crew and two belonging to the search parties.

Bellot.—Another tablet erected at the same spot bears the following inscription:

Sacred to the memory of JOSEPH RENNE BELLOT

Lieutenant of the French Navy.

Who was unfortunately drowned, by a sudden disruption of the
ice, in a heavy gale of wind, on the morning of 18th day
of August, 1853, whilst gallantly leading a small
party of British Seamen from the North
Star, up Wellington Channel, with
despatches for the Arctic
Searching Expedition

Amundsen.—The Northwest Passage was not again made until Roald Amundsen, the famous Norwegian Polar navigator who shared with the heroic but ill starred Robert Scott, the discovery in December, 1911 and January 1912 of the South Pole and the location of the South Magnetic Pole, navigated the tiny Gjoa, a stout, sailing sloop with a crude oil engine, from the Atlantic to the Pacific, 1903-06.

The object of Amundsen's voyage in the Gjoa was to locate the exact position of the Magnetic Pole on the west coast of Boothia Peninsula. This he did and established the North Magnetic Pole to be in Latitude 70.5 N and longitude 96.50 W.

Amundsen arrived at Erebus bay in the latter part of August, 1903, after having picked up the provisions left for them at Dalrymple island by one of the Scotch whalers, and then proceeded immediately down Peel Sound in order to get the Gjoa as near as possible to the magnetic pole before the sound became frozen over. He then slowly forced his way down Franklin and Victoria straits, where the unfortunate Franklin lost his ship and his life; then through Dease strait, Coronation gulf, Dolphin and Enion straits into the Beaufort sea, and thence, huggin the coast, to the Mackenzie river, where he had only to await the coming of Spring to follow the course of the whaling ships that every year visit Herschel island from the Pacific Amundsen finally emerged in 1906 and sailing through Bering strait reached San Francisco, where he was acclaimed by the world as the only man who had accomplished the north-west passage by sea.

Roald Amundsen in the light of this and his more recent exploits has proved himself a notable descendant of the Vikings and a worthy compeer of such a hardy Norsemen as Eric the Red, Hergolf, Biorn, Lief, Nansen, Sverdrup and Nordenskjold.

He now proposes, with Nansen's, Sverdrup's and his own old ship, the historic and incomparable Fram, to enter the Polar Sea through Bering strait and to darea four-year's drift, beset in the poleocrystic ice of the Polar ocean, across the neighbourhood of the North Pole itself.

To have located both magnetic poles; to be the only man to have navigated the north-west passage; the first to discover the South Pole and, with the single exception of Peary to bethe only man to visit the North Pole should beasufficient record to satisfy the most exacting ambition and betitled Amundsen as the most daring and successful Arctic traveler and ice-navigator that the world has known.

Bering Strait.—On November 26th and 27th, 1899 Charles Brouard of Southsea England was the first white man to cross the Bering straits between Asia and America on foot over the ice. The distance across the straits is 38 nautical miles, and the temperature at the time was 35° below zero. Brouard was accompanied by two Eskimos and a dog team of five: and it took him two days

This trip was previously attempted by Harry De Windt, who was compelled to remain on the Siberian coast and was rescued by the San Francisco whaler "Belvedere", as an Indian chief stole his provisions and left him to his own resources.

In the center of the straits are the Diomede islands and the Fairway rockand the depth of water runs from 20 to 25 fathoms.

Canadian Expeditions

Low.—On August 24th, 1903, Mr. A. P. Low, Geologist for the

Canadian Government left Halifax in command of the sealing steamer Neptune to patrol the waters of Hudson bay and of the eastern Arctic islands further north, and for the purpose of establishing permanent stations of the collection of customs and the ascertion of the Canadian juridiction, over these regions. Captain S. W. Bartlett was in command of the vessel in 1903.

The Neptune in the course of her voyage visited Navak bay in Labrador, Port Burwell, Cumberland Gulf, Kekertin, Blacklead, Cape Haven, Frobisher bay, Hudson strait and Douglas.

The cruise was continued past Southampton island to Furleton Harbour on the west side of RoesWelcome, where she passed the winter. A plan of Fullerton harbour was made duringthe winter. On July, 1904 the Neptune left Fullerton harbour and, after calling at Port Burwell for stores, steamed northward along the coast of Greenland until Cape Sabine, in Smith Sound was reached.

Smith Sound Region.—The Neptune sighted Cape York on the 8th of August and entered the fine harbour of Parker Snow bay, just inside of Conical rock. The hills surrounding Parker Sound bay, rise in abrupt cliffs nearly 1500 feet above the water; the country then rises less abruptly another thousand feet to the lower level of the great ice-cap which covers the entire interior of Greenland. A light pink gneiss, cut by many veins of quartz apparently all quite barren, is the chief rock of these hills. Cape York is a bold, bluff headland snow-capped and visible for a long distance in clear weather above the horizon as it is approached from Melville bay and marks the southern point of the stretch of arctic coast inhabited by the Smith Sound Eskimos, the most northerly human beings in the world. At the base of the headland nestles the most southerly of the Eskimo villages of that region.

Petiwik Glacier.—The Great Petiwik glacier was passed at midnight, with the sun shining over the top of its five-mile front of ice, which ends in abrupt low cliffs of ice rising directly from the sea. Large icebergs are frequently broken from this long face, and hundreds of them were seen aground on ledges for miles on both sides of the glacier.

Cape Atholl—The westward course was followed a few miles farther, after which the ship turned north through the fine channel between Cape Atholl and Wholstenholme island A small amount of loose ice was met with in the channel and in the crossing to Saunders island. The crystalline rocks which occupy the coast from Cape York give place here and to the northward to almost horizontal beds of sandstone and lightered coloured rock, probably limestone Large masses of dark trap are associated with these bedded rocks, either as sills injested along the bedding, or as dikes approaching more or less closely the vertical To the west lay the Cary islands, in Lat 76° 40′N , and between Long 72° and 73° W , where is the nameless grave of one of the ill-fated Kalstenius Expedition and where the Scotch whaler, Windward, was wrecked in a gale in July, 1907; Captain Cooney and his men making their way, after much hardship, in whale boats to Ponds inlet where they were picked up by the whaler Morning

Whale Sound —Cape Parry was passed at eight o'clock on the morning of the 10th of August, when, crossing the mouth of the Whale Sound, they followed the channel between Northumberland and Herbert islands, having a fine view of their high cliffs of sandstone and light-coloured rock, which rise almost perpendicular from 500 to 1000 feet above the sea Similar cliffs occupy the coast of the mainland from the north side of Inglefield gulf to the neighbourhood of Etah, at the narrowest part of Smith sound. The day was very fine, and only a few loose pans of floe ice and many icebergs embarrassed the course followed by the ship

Inglefield Gulf —The upper portion of Whale sound, Inglefield gulf and Mc Cormick bay were filled with ice, which from a distance appeared to be still unbroken from the shores During the day walrus were frequently seen in groups upon the floating pans of ice, where many large seals lay basking in the sun The walrus were most numerous on the ice between Cape Alexander and Etah, where attempts were made to photograph the larger groups, but without success, as it was late in the evening and the animals were unusually wild

Cape Alexander —As the coast is followed northward the cliffs and the mainland behind becomes lower, so that about Cape Alexander the general level of the front of the ice-cap does not appear to be greatly over 1000 feet in elevation

Scenery Cape York to Etah —Peary gives the following description of the scenery of the coastline between Cape York and Etah; Steaming in a northwesterly course from Cape York, we passed the "Crimson Cliffs", so named by Sir John Ross, the English explorer, in 1818 This vivid name was applied to the cliffs by reason of the quantities of "red snow" which can be seen from a ship miles out at sea. The colour is given to the permanent snow by the Protococcus nivalis, one of the lowest type of the single, living protoplasmic cell. The nearly transparent gelatinous masses vary from a quarter inch in diameter to the size of a pin-head, and they draw from the snow and the air the scanty nourishment which they require Seen from a distance, the snow looks like blood This red banner of the Arctic greeted me on all my northern journeys. These cliffs extend for thirty or forty miles.

In a little oasis lives the meagre and scattered handful of the Eskimo population a little oasis along the frowning western coast of Northern Greenland between Melville bay and Kane basin. This region is three thousand miles north of New York City, as a steamer goes; it lies about half-way between the Arctic Circle and the Pole, within the confines of the great night. Here, taking the mean latitude, for one hundred and ten days in summer the sun never sets; for one hundred and ten days in winter the sun never rises, and no ray of light save from the icy stars and the dead moon falls on the frozen landscape.

Scenic splendour.—"There is a savage grandeur in this coast, carved by eternal conflict with storms and glaciers, bergs and grinding ice-fields; but behind the frowning outer mask nestle in summer many grass-carpeted, flower sprinkled, sun-kissed nooks. Millions of little auks breed along the shore. Between the towerring cliffs are glaciers which launch at intervals their fleets of bergs upon the sea; before these cliffs lies the blue water dotted with masses of glistenning ice of all shapes and size; behind the cliffs is the great Greenland ice cap, silent, eternal, immensurable the abode, say the Eskimos, of evil spirits and the souls of the unhappy dead.

Sun kissed oasis.—"In some places on this coast in summer, the grass is as thick and long as on a New England farm. Here bloom poppies, with dandelions, buttercups, and saxifrage, though to the best of my knowledge the flowers are all devoid of perfume. I have seen bumble bees even north of Whale Sound; there are flies and mosquitos, and even a few spiders. Among the fauna of the country are the reindeer (the Greenland caribou), the fox-both blue and white the arctic hare, the polar bear, and perhaps once in a generation, a stray wolf.

Vivid colouring.—"The listless sea and the over arching sky are a vivid blue in the sunlight-more like a scene in the Bay of Maples than one in the Arctic. There is a crystalline clearness in the pure atmosphere that gives to all colours a brilliancy seen no where else the glittering white of the icebergs with the blue veins running through them; the deep reds, warm grays, and rich browns of the cliffs, streaked here and there with the yellows of the sandstone; a little farther away sometimes the soft green grass of this little Arctic oasis; and on the distant horizon the steel blue of the great inland ice. When the little auks fly high against the sunlit sky, they appeared like the leaves of a forest when the early frost has touched them and the first gale of autumn carries them away, drifting, eddying through the air. The desert of northern Africa may be as beautiful as Hichens tells us; the jungles of Asia may wear as vivid colouring; but to my eyes there is nothing so beautiful as the glittering Arctic on a sunlit summer day.

In winter time.—"But in the long sunless winter the whole region cliffs, ocean, glaciers is covered with a pall of snow that show a ghastly gray in the wan starlight. When the stars are hidden all is black, void, and soundless. When the wind is blowing, if a man ventures out he seems to be pushed backward by the hands of an invisible enemy, while a vague, unnamable menace lurks before and behind him. It is small wonder the Eskimos believe that evil spirits walk upon the wind."

Near Etah.—On the trip northward the Neptune passed close to several of the places where the Eskimos usually reside during the summer months, but no signs of them were seen (August 11th) as far north as the Littleton islands, whence they crossed to Cape Sabine, after making a call into the harbour of Etah, famous as the most northern habitation of humans on the earth, being 78° 30′N., latitude. At Etah they saw a number of deserted underground houses, where the natives live during the winter, and a small quantity of coal left by Peary, who used this place as headquarters during one of his attempts to reach the Pole.

Heavy Arctic ice.—The Neptune voyage northward was stopped by heavy sheets of Arctic ice coming down Smith Sound in the vicinity of Littleton islands. A crossing was made to Cape Sabine, and considerable anxiety for the ship's safety was felt when passing between the great pans of thick solid ice, some of which were miles in extent, and rose from three to six feet above and seven times that thickness below the water, with pinacles of much greater height. Some very hard knocks were given to the ship as she was forced through the heavy ice from one lead of water to the next, and every body on board felt relieved when the little harbour at Cape Sabine was reached in safety.

Payer Harbour.—A landing was made here, and a visit paid to the last winter quarters of Peary, which are situated near the eastern end of the cape on the side of Payer harbour, formed by a few small islands lying a short distance from the cape. The harbour being full of ice, the ship could not enter it, but stood off under steam, it being dangerous to anchor with the large sheets of heavy ice passing southward on the tide. The landing was made about a mile from the house, which was reached by climbing over the granite cliffs of the shore, on two o'clock on a delightful calm, clear morning, with the sun well above the horizon.

The station consisted of two small houses, one belonging to Peary, being the old deck-house of his ship the Windward, the other, a small building with single-boarded sides, in which the Stein expedition spent two winters. The houses were only a few yards apart both about 50 yards from thewater, and surrounded with the usual heaps of old tin cans and empty boxes found about northern quarters where the staples of food are carried in cases. A large amount of putrid walrus blubber was scattered everywhere about the place, and the smell from it was far stranger than that of a deserted snow-house in springtime, which was the previous limit to pungent and disagreable odours. On a low rocky hill, a few yards behind the houses, were the burial mounds of five Eskimos, four adults and one child, all wrapped in musk-ox skins and loosely covered with stones. An old gun, snow knives, and other gear belonging to the dead were placed alongside the graves. These must havebeen cheerful company during the long arctic night, especially so close to the scene of the Greely disaster, when so many of the party died of starvation and sickness before relief could reach them.

The power of the ice-floes.—When one has been at the headquarters of these Arctic expeditions, a good idea is gained of the difficulties and privations of those engaging in polar research.

On returning to the boat, they found that a very large floe had come between them and the ship, and in doing so a corner of it had caught on a small island and had gone completely over it, showing the momentum of these great cakes, and the hopelessness of attempting to build a ship strong enough to withstand the pressure exerted by such ice moving on the tide and when suddenly arrested by land or by motionless ice. A narrow lane of water still showed between the floe and the land, and by hard rowing they got safely through before it closed, when the ship butted her way through other ice and took them on board.

Ross bay.—Ross bay was now crossed so that a record might be left at Cape Herschel on the mainland of Ellesmere, Cape Sabine being on an island separated from the mainland by a narrow strait. When about a mile from Cape Herschel, going full speed and while an attempt was made to pass between two small icebergs, the ship struck heavily on a sharp point of rock, and bounced off, striking again amidships and finally on the stern-post. The damage although serious was fortunately not enough to prevent the ship from continuing her voyage.

A landing was made at Cape Herschel where a document taking possession of the large island of Ellesmere in the name of King Edward VII, for the Dominion of Canada, was read and the Canadian flag raised and saluted. A copy of the document was placed in a large cairn built of rock on the end of the cape.

Coast near Cape Isabella.—Steaming southward, the heavy dangerous ice from Smith sound was soon left behind. They continued southward, all day (August 11th), passing as close to the land as the ice would allow, so as to make a chart of this badly surveyed coast. The survey was carried to a point about fifteen miles south of Cape Isabella, while the weather became foggy and progress through the ice was only possible by following leads of open water running south-east or diagonally away from the coast.

East coast Ellesmere land.—The eastern side of Ellesmere island is quite high, the probable general elevation exceeding 2000 feet, and perhaps 3000 feet. The coastline is broken by many deep bays and prominent headlands. The land rises precipitiously from the frozen sea into irregular mountains, where partly rounded peaks are as a rule masked by an ice-cap which appears to be continous along this eastern coastal region, although it is said not continued for any great distance inland. Great glaciers fill all the valleys and actively discharge icebergs into the bays. Only the projecting rockyheadlands and some of the lower points facing south in the bays are free of snow and ice, so that at least nine-tenths of the surface is permanently covered by an icy mantel. This is in marked contrast to the Greenland coast opposite, where all the outer cliffs and the shores are comparatively free from snow and ice, The cause of this marked difference of climate is probably due to a divergence of direction of currents along these coasts. On the Greenland side a southerly current, comparatively free of ice, allows the open sea to raise the general temperature where to the Ellesmere side the Arctic current, with its continous stream of ice, blocks the bays and dœs not allow the open water to ameliorate the cold of ice-covered lands. The prevailing easterly winds also carry more moisture to the west side, causing it to be masked by fog at the time of brilliant sun-shine on the opposite coast.

Lancaster Strait.—After this the Neptune crossed the entrance of Jones sound, entered Lancaster sound and visited Cunning creek,Erebus bay and Port Leopold in the middle of August 1904. From the summit of Beechy island no ice could be seen to the westward or northward in Wellington channel and Barrow strait.

Low's instructions limited the cruise westward in Lancaster sound to their present position, and the damaged condition of the ship, together with a supply of provisions and coal insufficient for another winter in the ice, all militated against an attempt to make the North-west passage, which under favourable conditions then, seemed possible.

East Coast of Baffin Land.—The Neptune next visited Button Point, Ponds inlet, Eclipse sound, Salmon river, Erik harbour, and then on August 22nd, steamed southward from Erik harbour along the Baffin coast. The fog closed down shortly after leaving and large sheets of heavy ice forced them to the eatsward away from the land, which was not seen again until they were within a few miles of Cumberland Gulf, on the morning of the 27th. Meanwhile the ship, continuously battling with heavy floes of northern ice, had been forced nearly over to the Greenland coast and had to work her way back to the western side of Davis strait to visit Cumberland gulf. They reached Blacklead island on August 31st, through heavy ice which completely filled the gulf, having passed a small Norwegian brigantine tightly beset in the ice about 20 miles from that place. At Blacklead they were visited by the Rvd. J. Peck of the Anglican mission there and by the agent of the whaling station, who informed them that, owing to the succession of easterly gales that had occured during the winter, the past year had been very unprofitable to the whalers and disastrous to the natives. The Neptune reached Port Burwell on September 4th and after visiting Wakeham bay on the south side of Hudson strait, Douglas harbour, Sudluk bay, Salisbury island entered Fullerton harbour on September 16th. Near here she met the Scotch whaler Active, returning from Repulse bay and Captain Comer's ship, the Era. The commander of the Active had entered Hudson strait early in July and had experienced great difficulty with ice, while crossing Fox channel from King's Cape to Seahorse point on Southampton island. The Active had proceeded up Roes Welcome to Repulse bay, which she did not enter until August 10th which was still solidly frozen, although little ice was met with in Roes Welcome. Frozen strait remained full of ice all the summer season.

Fox Channel ice.—The Neptune left Fullerton on September 25th in fine weather and found that the ice from Fox channel had advanced southward and westward 25 miles since they last saw it, which necessitated their keeping close to Mansfield island. Calling at Wakeham bay to drop their pilot, they reached Port Burwell on October 1st and reached Halifax on October 12th, after fifteen months' absence. They entered the strait of Belleisle, after a fine passage down the Labrador coast, and the trip across the Gulf of St. Lawrence and the coast of Nova Scotia was rough.

Result of trip.—In addition to establishing Mounted Police and Custom House stations at Port Burwell and Port Fullerton; extensive meteorological observations and examination of the geological formation of the places visited by Mr. Low were made and thus a vast amount of geological knowledge of Hudson bay and the Arctic islands was added to what had previously been acquired.

Published Report.—On account of the voyage with extensive chapters on the Eskimos, trade possibilities navigation, tides, ice, currents, geology, flora, fauna, fossils and historical summary of Arctic explorations was embodied in Mr. Low's very valuable and interesting book. "The Cruise of the Neptune, 1903-04," which was published by the Marine and Fisheries Departmentof the Government of Canada.

Capt. Bernier.—The next expedition was sent to Hudson Bay by the Canadian Government in 1904 under the Command of Capt. Bernier to establish Mounted Police stations and to annexe to Canada all the Arctic territory granted by the British Imperial Government. The Arctic which had been bought by the Canadian Government from the Government of Germany was the ship selected for the work; she had been especially constructed for a German Antarctic expedition and is probably the strongest ship in the world for ice-navigation. The Arctic spent the winter of 1904-05 at Fullerton harbour. On July 1st, 1905, the Arctic commenced breaking her way out of Fullerton harbour, and left the harbour on the fifth. On the tenth of July the vessel was 400 miles from Churchill; the ice was packed tight, and the vessel was headed for Hudson strait and on July 14th, ran clear of all ice and returned to Quebec.

Cruise of the Arctic 1906-07.—In 1906 the Arctic was dispatched by the Canadian Government, under the command of Captain J. E. Bernier, to patrol the waters of the Arctic regions, and to hoist the flag and deposit records of annexion in cairns of stones on the Arctic islands.

Islands visited.—The Arctic left Quebec, on July 28th, 1906, and passing along the coast of Greenland, visited Albert harbour, Button Point, Navy Board Inlet, Lancaster sound, Port Leopold, Barrow strait, Cornwallis island, Griffith island, Bathurst island Byam Martin and Melville islands. All these islands together with Prince Patrick island and the whole Parry group of islands were taken formal possession of and records were left at the different places touched and cairns built as tokens of their annexation. The most westerly point reached, on this voyage, was Arctic point, on the south-east end of Melville Island, where documents claiming for the Dominion of Canada, in pursuance of the grant of these islands by the Imperial Government, all islands and lands adjacent to the territory visited.

Peel Sound and Erebus Bay.—From Melville island, the steamer proceeded east-ward to Lowther island, and entered Peel sound going as far south as Cape Whitehead on North Somerset island. The course was then changed to north to Limestone island and from there to Resolute bay, on the south of Cornwallis island, and from Resolute bay eastward to Erebus bay, where the memorial tablet erected to Sir John Franklin was re-erected. Admiralty inlet was entered, several points and bays named, and then the vessel returned to Navy Board inlet and coasted south and east until Albert harbour in Ponds inlet was reached, where the Arctic wintered. The Arctic in 1907; proceeded east and north to Cane island, Jones sound, on the east coast of North Lincoln, where a flag was raised and records left; from there her course was directed east, across Baffin bay to the coast of Greenland until about opposite Cumberland gulf; when a crossing was made westward to Cumberland gulf, which was entered and Kekerton reached.

Port Burwel'.—The course was then made to Blacklead, and from there to Port Burwell, where some soundings were taken and some beacons placed. From Port Burwell the Arctic returned to Quebec, where she arrived on October 19th, 1907.

Numerous places visited.—The voyage was noted for the number of places visited in Lancaster sound, Barrow strait, Peel sound, Prince Regent inlet, Admiralty inlet, Navy Board inlet, Ponds inlet and the visit to Cone island, Jones sound latitude 76° 20′ north, longitude 81° 30′ west. Harbours, bays and straits, visited by Sir Edward Parry and by the expeditions sent in search for Sir John Franklin, were also visited by the Arctic. In addition, many records were left in different localities, to apprise all interested of the fact, that all lands and islands in the Arctic and northern regions, granted by the Imperial Government, were taken possession of and now formed part of Canada.

Report of voyages.—The report of this voyage was published in 1909, by the King's Printer, for the Department of Marine and Fisheries at Ottawa.

The ship's company on the voyage, including officers and crew consisted of 41 persons. The report of the voyage of 1906-07, shows that the voyage was difficult owing to head winds, foggy weather and to meeting heavy ice.

Cruise of the Arctic 1908-09.—In 1908 the Arctic was again despatched by the Canadian Government, with Captain Bernier in command, and a crew all told, numbering 43, to patrol the northern waters and to continue the work of annexing the Arctic islands to Canada.

Quebec Tercentenary.—The Arctic on this occasion left Quebec the 28th, of July 1908, in the midst of the festivities that were being held in the occasion of Tercentenary Celebration of the founding of Quebec, and steamed between the vessels of the British fleet and several French and American vessels that were at anchor. As the Arctic steamed down the river on her long cruise the band of H. M. S. Indomitable played "Auld Land Syne", H. R. H. the Prince of Wales, now King George V. of England was then present in Quebec.

Etah.—Proceeding, as before, up the west coast of Greenland the Arctic passed Cape York on August 17th and dropped anchor in Etah harbour, on the east side of Smith sound, on August 19th. There they found the supply ship under the command of Captain Samuel Bartlett, which had been chartered to carry coal to Peary's ship. The ship Rosevelt, of the Peary expedition, had left for Kane Basin and Poleson channel the day before. They landed stores at Etah during the night for Dr. Frederick Cook, of Brooklyn who was away at the time on a solitary and plucky attempt to reach the North Pole. At Etah, being Commander Peary's headquarters, there were considerable quantities of stores and coal on the shore and also a few aged Eskimos in charge of the Eskimo women. An effort was made to procure two teams of dogs, but the men in charge of Peary's stores would not sell the dogs on any account. In the harbour of Etah, especially in the eastern part, a vessel in an emergency could be beached and repairs made to her bottom or propeller at low waters. Very few places offer the same advantages in northern waters along the Greenland coast.

Lancaster Sound.—Leaving Etah on August 20th the Arctic steamed along the shore of Ellesmere land and across the mouth of Jones sound, where a quantity of small rotton ice was encountered in the midst of which were some large icebergs entering Lancaster sound, into which they drift for a certain distance, until they meet the western tide which drives them out of the sound.

Entering Lancaster sound, Erebus bay was reached on August 24th where they landed four boat loads of provisions and built a shelter over them as a precaution in case they should be compelled to abandon the ship. Leaving Erebus bay the same day they continued westward towards Griffith island, meeting the pack ice 24 miles west of Erebus bay, to which they made fast in a dense frozen fog.

Barrow Strait.—As leads were opened in the ice by the wind and tides they pushed on westward along the south shores of Cornwallis and Bathurst islands and past the smaller islands of Baker and Moore. Near Acland bay the water is very shallow although the soundings 5 to 16 fathoms are regular, and a bad rocky patch, with a tide ripple, was observed due west of Moore's island in latitude 74° 57′N., and 99° 25′W., Byam Martin island, all covered with snow, was passed on August 26th, where herds of musk-oxen and caribou were seen grazing on the low grassy plains of that island. Professor Haughton was of opinion that. "The sandstone of Byam Martin island is of two kinds-one red, fine stratified, passing into purple slate, and very like the sandstone of Cape Bunny, North Somerset, and some varieties of the red sandstone and slate found between Wolstenholme and Whale sound, West Greenland, lat. 77° N. The other sandstone of Byam Martin island is a fine, pale greenish, or rather grayish-yellow, and not distinguishable in hand specimens from the sandstone of Cape Hamilton, Baring island as essentially composed of sandstone, with some granitic and feldspathic rocks, these last being probably erratics, carried there by the ice". Parry's Cape Bounty was passed on the 27th and at 10 p. m., they sighted Parry's Rock, which from the sea resembles a square dwelling, at the entrance to Winter Harbour, and upon which Parry had inscribed a short record of his prolonged stay there in 1819-20. Continuing to the westward they attained latitude 74° 29′ north, longitude 112° west, near Cape Providence where a depot of provisions was established. No ice was visible to the westward, but heavy Arctic ice was seen to the south. They were then half way through McClure strait and the commander, in his report, stated that if their instructions had included the making of the Northwest passage, he felt confident they could have done so. Off Cape Providence, where the water is bold to the shore, the flood tide runs westward and the ebb tide eastward, and the general outflow is eastward, carrying many large fields of ice, in the fall of the year. McClure strait is from 50 to 55 miles wide and is the only proper passage to make the passage westward to Herschel island near the mouth of the Mackenzie river.

Winter Harbour.—Turning back the "Arctic" steamed to Winter harbour which she entered without difficulty and anchored there for the winter in 7 fathoms of water in Lat. 74° 47′ 10″ north and long. 110° 48′ 15″ west. Magnetic variation, 98 degrees east; the dip of the magnetic needle was 88° 43′. High water full and change at 1.30 p. m. and the rise of the tide, 3 feet 3 inches.

Scientific Observations.—They spent the winter at Melville island where extensive and valuable meteorological, geological, geographical, botanical, zoological observations and specimens of birds and rocks were brought back. Melville island consists of carboniferous sandstones and limestones containing coal, sandstone, clay-ironstone and brown haematite. The carboniferous limestones, with characteristic fossils, underlie the limestones, so that it is probable that the coal beds of Melville island are very low down in the series, and do not correspond in geological position with the coal beds of Europe.

Ice and Snow.—McClure strait fills with heavy ice-floes from the Beaufort sea during the fall, and finally closes about the first week in November. The polar basin having a higher level, the water runs toward the east and south, carrying with it an immense quantity of ice. The snow at Winter harbour was deeper than at Ponds inlet, giving proof of more moisture, and consequently of more open water northwest of Melville and Prince Patrick islands.

Climate.—The last week of December was the coldest of that winter; the thermometer registering 50°, 53° and 56o below zero on the 27th, 28th and 29th respectively, the lowest temperature recorded by Parry was 65° below zero in January 1853. Gales were frequent and blew with an intensity of from 40 to 100 miles an hour. The ice attained a maximum thickness of eight feet (96 inches) on June 3rd; and first began to move in the harbour the 31st July. On August 3rd., the Arctic was blown out of Winter harbour with the ice and on August 4th, all ice was gone from the harbour. The prevailing winds during the winter were from the north-north-west. Snow fell during every month in the year but July, while in that month the only thunderstorm occured. Storms were most numerous from November to April, attaining a maximum in February. The most violent storm was centred on February 8th and showed a velocity of 86 miles an hour for a continuous hour and for a fifteen minute period of 100 miles an hour. The mean temperature of the air, taken by Parry on H. M. S. Resolute at Dealy island, when beset in the ice-floes, showed between 1st July, 1852 and 30th June, 1853: 7°9.

Mean temperature Vegetation and animals.—In the spring of 1909 Melville island was covered with luxuriant flowers and Arctic lichens, grasses and mosses on which grazed thousands of musk-oxen and Arctic caribou. Hares, wolves, foxes, lemmings, polar bear, walrus and seal were abundant, and the waters of the shore teemed with small fishes and marine life.

Polar Tides.—W. Bell Dawson, Superintendant of Tidal Surveys, to whom the tidal observations obtained by the officers of the Arctic were submitted gave it as his opinion that they had succeeded in obtaining the true tide of the Arctic ocean itself, as the observations were taken within 200 miles of the open ocean to the north. The small range of the tide, less than five feet, indicated its oceanic character; the diurnal inequality amounting to about 25 per cent of the range . These features, according to Mr. Dawson, accord better with an oceanic origin, than with a tide which could only reach Melville island by traveling many hundred miles through a series of straits and sounds from the region of Baffin bay and Davis strait. The tidal observations obtained at Spitzbergen by the Swedish Government, from March to July in 1900, show a range of tide which is much the same as at Melville island. Systematic tidal observations were taken by the Peary Polar Expedition in 1908-09 along the northern coast of Grant Land and Greenland, as it was believed that such observations might throw light upon the possible existence of a considerable land mass in the unknown area of the Arctic ocean. The semidaily range of tide at Cape Morris Jusup was found to be only 0.38 feet; and at Cape Bryant, northwest of Robeson Channel, the range is 1.07 feet.

Peary reported:—"One of the most important results brought out from the tidal observations of the expedition is the fact that high water occurs two hours earlier (in absolute time) at Cape Columbia than at Cape Sheridan. The Cape Columbia tides are even earlier than the tides along the northern coast of Spitzberger islands. These facts prove that the tide at Cape Columbia comes from the west. It is the Baffin Bay tide transmitted, first, northwesterly through the eastern portion of the Arctic Archipelago to the Arctic Ocean, and then easterly along the northern coast of Grant Land to Cape Columbia. That the tide wave should be felt after a passage of this kind, instead of practically disappearing after entering the Arctic Ocean, is one argument for the existence of a waterway of limited width to the northwest of Grant Land. This suggests that Crocker Land, first seen by Peary on June 24th, 1906, from an altitude of about 2000 feet, may form a portion of the northern boundary of this channel or waterway. The tides along the northern coast of Greenland are due mainly to the large rise-and-fall occurring at the head of Baffin bay. The Arctic Ocean being itself a nearly tideless body so far as semidaily tides are concerned, it follows that the time of tide varies but little as one goes through Smith sound. Kane Basin, Kennedy Channel and Robeson Channel; in other words there exists a stationary oscillation in this waterway. A no-tide point doubtless exists in Lincoln sea, off Peary Land. The semidiurnal tidal forces vanish at the Pole and are very small over the entire Arctic Ocean. As a consequence the semidiurnal portion of the tide wave in these regions is almost wholly derived from the tides in the Atlantic Ocean. Such tides are essentially equilibrium tides for this nearly enclosed body of water.

Description of tides.—For the benefit of those who are not well posted in the matter of tides the following information, while elementary, may be useful.

The alternate movements of the waters of the ocean, which are raised and lowered by the attraction of the sun, and especially of the moon, are called the Flood (flow) and Ebb (reflow) of the tide. The moon on account of its proximity to the earth exercises an attractive force over the waters of the ocean two and a half times as great as that of the Sun. The Flood and Ebb Tides succeed each other at intervals of 6h. 12½ minutes; so that there are two high tides and two low tides every day of 24h. 50 minutes, which corresponds to the lunar day. One lunar hour = 1.035 solar hours.

When the moon rises over any particular portion of the earth's surface, the attraction is strongest and the waters nearest the moon, being more mobile than the solid globe, rise in consequence; and, as the moon disapears, fall again. The earth at the same time, being also attracted, is drawn in a lesser degree towards the moon, with the result that the waters on the other side of the globe remaining inert, are also raised. In this way, there are constantly at opposite portions of the earth's surface always two high tides, one in the direction of the moon and the other in the opposite direction; while the sea is correspondingly lowered on the intermediate surfaces of the globe, when low tides occur. These two swellings of the ocean follow the moon as it moves round the earth. The high tides, however, do not arrive at the same time as the moon passes over the meridian of any particular spot, but, on account of the inertia of the waters, 36 hours later. The sun or moon is said to be in meridian when it is highest in the heavens over any particular spot. A "lunitidal interval" is the time elapsing between the passage of the moon acroos the meridian of the place or station and the occurance of high or low water.

The hight of the tides is variable, and high tides occur when the sun and moon are in conjunction or in opposition; at the time of the Equinoxes they are greatly affected by the contours of the land and the force of the winds. When the sun and moon and earth form as it were a right angle, the moon is said to be in quadrature with the sun, and the action of the one tends to neutralize the force of attraction of the other, and the tides are, in consequence, lower than at other times. The highest tide occurs in the Bay of Fundy, where it rises to a height of 60 to 70 feet. In the open ocean the tide may rise and fall only a few inches.

The ocean covers three-fourths of the surface of the Globe, or about 145,000,000 square miles. The average depth is about 14,000 feet and the maximun sounding ever obtained, in the middle of the Pacific Ocean, was 31,614 feet (about six miles) which is deeper than the altitude of the highest mountain on the earth.

Sled parties.—In the spring of 1909 sledge parties were dispatched from · Winter harbour to cross McClure strait with the object of hoisting the flag and leaving records of the formal annexion of Banks island, Victoria island and Prince of Wales island to Canada.

Morin.—On March 30. O. J. Morin, second officer, accompanied by Napoléon Chassé and Renben Pike started from Winter harbour and crossing McClure strait accomplished the work of annexing Banks island and Victoria island,and left records at Cape Russell of the fact of annexation. The journey was carried out with great hardships owing to the difficulty of traveling over rough hummocky ice with deep snow in the depressions, and to the destruction of their food supplies by bears and their oil fuel running short. The loss of these, temporarily cached about five miles from Cape Russell, Banks island, prevented Mr. Morin from continuing his trip to princess Royal islands, which he proposed doing. He did not find any of McClure's cairns either at Cape Russell or Mount Observation; and concluded, as there were no rocks in the vicinity, that they must have been composed of sand and gravel and have been destroyed by the gales of the locality, which are frequent and heavy from the north and east. When returning they suffered greatly from hunger, thirst and blindness. On May 3rd, they came across on a block of ice, an uprooted a tree of red spruce, about 30 feet long and 14 inches in diameter, which was slowly being drifted eastward with the ice through McClure strait.

Green.—Another party under third officer C. W. Green had been dispatched in April to Bay of Mercy, Banks island to examine the cairn left by Lieut. McClure on his voyage from Bering Sea to Banks island, and to locate a coal seam 9 miles east of Cape Hamilton. Mr. Green was also instructed to search for the remains or signs of McClure's ship, the Investigator, which was abandoned in 1853 and also to look for a depot of a large amount of stores left by Commander McClure and Captain Krabbie in 1854. Mr. Green's party returned to Winter harbour on June 11th in a very exhausted condition, as they suffered great hardships when crossing McClure strait, being short of food as the bears had, as in the case of Mr.Morin, destroyed their provisions. They had to travel over pinacle ice and deep soft snow into which the men sank to their hips and they suffered from swollen feet and sore eyes. They also suffered from rhumatism and diarrhea owing to wet clothes and sleeping bags. Mr. Green discovered seams of coal on the north shore of Banks island and found the remains of a large cairn near Cape Hamilton with a pick-axe of ancient make, and stamped with broad arrow and name. Some previous party had evidently visited and rifled it of any record that it might have contained. He found the remains of two more cairns near Back Point but no records. Near Back Point they found the crater of an extinct volcano, where they left a record. They collected samples of the iron ore which was scattered around in all directions. While travelling in and around Mercy Bay, they found ancient traces of Eskimos at Back Point and at the bottom of the bay: rings of stones showed where they camped, also bones of seals and deer lay strewn about. Mr. Green concluded his report: "My opinion is that the Investigator is now lying on the bottom of Mercy bay, and all the caches and cairns have been rifled by whalers."

Morin.—On May 17th, 1909. Mr. Morin accompanied by William LeBel, William Doyle and Reuben Pike started on a second journey to Mercy bay, Banks island. They journeyed along the shore of Melville island until Cape Providence was reached. On May 22nd they started across McClure strait, and setting the sail on the sledge ran before the wind over smooth ice. clear of snow for 16 miles, which they covered in 2½ hours. After that they had to hand the sledge by drag ropes as the wind failed them and the ice became too rough. They sighted Banks island, miles away, on May 27th, which they reached on June 2nd. The shore of Banks islands is composed of sand, gravel and a reddish shale rock. Deer trails were observed leading to the south through the ravines that run inland every mile and a half. The coast is elevated in flats, 500 to 700 feet high, and is covered with abundant vegetation of moss. Mr. Morin found pieces of coal very hard, bright, black and brittle as glass which when broken, made no dust. Traces of polar bears, deer, foxes, wolves and rabbits were numerous; also gulls, ptarmigan and other Arctic birds. There was a tremendous pressure of ice all along the coast. He found Lieut. Court's cairn near Cape Hamilton, Which Mr. Green had previously visited and had left a record.

On June 6th he reached Point Providence, and searched around for McClure's cairn; but found only a few rocks scattered around on the sand. Entering the Bay of Mercy he found at first smooth young ice. Later he encountered very old ice, which was smooth and covered fully two-thirds of the bay; which led Mr. Morin to the conclusion that the interior of the bay had not seen open water for very many years, although he thought that there had been open water at the mouth of the bay the previous autumn. They reached McClure's old depot where they found about six tons of coal. "With this all that can be seen of the large deposit that was made by the crew of the Investigator in 1853, were pieces of sails, pieces of old ropes, and debris of packing materials. We could not locate the cemetery where were buried three members of the crew of the Investigator, nor could we find any trace of Mr. Green's passage at the cache. Nothing could be found of the records left by Mr. McClure, everything had disappeared. As to the ship Investigator, it sank in the bay, or has drifted away. No trace of her can be seen. We then proceeded to the far interior of the bay, a distance of several miles, to McClure's cache. The land here is elevated by a series of plateaus, separated by ravines. The grade is easy, and forms good moss pasturage. Great disturbances must have taken place in this part of the country in centuries past. The volcanœs at Point Back can be seen from here, and must have been the cause of this strange and noticeable disturbance of the hills. During the day Pike and Doyle made a hunting trip into the interior, and killed two deer, from which we got a good supply of fresh meat for the return journey. During the day I, with LeBel made observations of the formation of the hills, and found mountains of limestone, separated by ravines. The east coast of Mercy bay is much higher than the west coast. We rebuilt the cairn at the point where a cairn had been erected by the crew of the Investigator in 1853, and erecting the flag and using the barrel of our rifle for a staff, I officially took possession of Banks island, in the name of Canada, and left a record of the trip, wrapped up in the folds of the flag, which was deposited in the cairn."

Mr. Morin and his two companions returned, across McClure strait, to Cape Providence and Winter harbour, arriving there on June 20th., they were much hampered by the quantity of water on the içe, after being forced to walk up to their knees in the cold water, and sometimes it was deeper.

Kœnig.—The Chief Engineer, John Van Kœnig, was in charge of the depot of provisions at Cape Providençe which was the starting point of the parties that left for Banks island, He found that bear and musk-ox grease made good fuel when soaked in waste and shot ptarmigan, musk-oxen, ducks, Brant geese, sparrows, seal and hares. He noted that the musk-oxen shed their wool freely in May and picked up a quantity on the ground. He saw many herds, varying in number from 16 to 40. Seal were more plentiful at Cape Providence than at Winter harbour; they could be seen a mile and a half from the beach, 20 in a group, on fine days, but were difficult to approach on account of their acute hearing and the level nature of the ice. Peat valuable for fuel was found in large quantities near Point Philipps twelve miles west of Winter harbour.

Jackson.—Mr. Jackson visited Cape Bounty and took observations for variation-compasses, on account of the overchanging magnetic variation, were found to be of little use in those latitudes. The variation had apparently diminished since Parry's time. For sledge travelling the only correct and reliable bearings are the sun's true bearings. Every officer was provided with a pocket card, on which was marked the sun's bearing every twenty minutes for the 24 hours during the long days. The need of dogs for drawing the sleds was felt badly; as when the men had to draw their own supplies over snow too soft to bear them, the traveling was extremely slow and hard work.

McMillan.—Mr J. G. McMillan, with Mr. Jackson and James Brace visited Cape Bounty, Dealy island, Captain Kellett's and McClintock's headquarters in 1852-53, Bridport inlet and Skene bay. At Dealy island 35 miles east of Winter harbour, were found the storehouse, built of stones by Captain Kellett of the Resolute in 1854, and the graves with headstones of three men who died on board the Resolute and Intrepid. The roof had been blown to some distance and was in pieces; there was considerable water on the floor and a quantity of damaged stores. A considerable portion of the provisions was in good state of preservation; enough had been left in 1854 for 66 men for 266 days. These included casks of flour, peas, potatoes, sugar, tea, rum, clothing, ammunition, books, three tanks of bread and cans of pork, mutton and carrots so placed as to form an end of the building. A can of pork when opened seemed to be still fit for food, and the woollen clothing was in as good a condition as when left there 55 years ago. Felt and leather boots were damaged by leakage from casks. The clothing had been packed in thick oak barrels with iron staves. Two muskets were found, but were useless, and were taken home to be placed in the national museum. These guns were replaced by two Ross rifles and 1000 rounds of ammunition. The cache was re-roofed stocked with provisions. Depots for shipwrecked parties were also established at Cape Providence, Port Leopold, Erebus bay and Ponds inlet.

Bridport Inlet.—Bridport inlet was !named after Lord Bridport by Parry. Soundings gave 25 fathoms inside the harbour, which was large enough to hold the whole naval fleet of Britain, the shores being 300 feet high and consequently protecting the harbour from violent winds.

Parry's Garden.—Parry's old garden was located, where he had tried the experiment of gardening and growth of vegetables in the Arctic without success, as the seeds that were sown did not germinate, although flowers indigenous to the soil and grasses grow luxiriantly on Melville island.

Liddon Gulf.—Mr. McMillan, accompanied by Reuben Pike made a trip in July to the eastern shore of Liddon gulf. The intervening country is very level, resembling an old lake or sea bottom, and is studded with shallow lakes at a level of about 270 feet. Shale beneath grey sandstone composed the rocks On the shores of Chevallier bay pieces of coal and bituminous shale were found. A river 50 yards wide and 3 feet deep in the shallowest part, was forded near the east side of Chevallier bay. Traces of old Eskimos encampments had been found previously on the eastern and northern shores of Liddon gulf.

Records.—Records that had been left on Melville island in cairns prominently placed on the shore by Captain Kellett, Commander Parry and Lieutenant Meecham were found and brought back.

North-West Passage.—On the practicability of the North-west Passage, Captain Bernier reported: "In regard to the North-west Passage, which received so much attention from early navigators and which they displayed so much anxiety to find and safely navigate, I here express my opinion, based upon observations so far as I have gone, and from information received from whalers who had come from the Pacific. I have not any doubt that with wooden ships and the aid of charts and other informations published, that the Northwest passage can be made without much risk. The discovery of the passage by Commander Roald Amundsen, along the coast of the mainland, is not practicable for merchant ships of size on account of the shallow water in Dease and Simpson straits, and the ice jams in Victoria strait in which Sir John Franklin's ships were caught.

"The safest and best passage fron the Atlantic to the Pacific, is by Davis strait along Greenland, as far north as Cape York, crossing Davis strait in northern waters, coming south then to Lancaster sound along North Devon, keeping North Devon island close on board all the time until Erebus bay is passed, then crossing the Wellington channel to Cape Hotham on Cornwallis island, keeping it near until Griffith island is reached. On no account should that island be left out of sight in passing; vessels should pass to the north if possible, as the ice is always kept in motion by the tide, then cross MacDougal's channel well to the north. Bathurst island should be within three miles all the time of passing along its coast. Baker island will appear dark if no snow has fallen on it, but a snow squall will change its appearance to resemble a large mass of floating ice. Moore island under the same conditions will appear exactly like Baker island; mariners should, therefore, guard against being deceived after a snowfall. This part of the coast of Bathurst island shows shallow water as far as Cape Cockburn. The direction should be continued across Austin channel to Byam Martin island, keeping along the coast of Melville island into McClure strait, and then proceeding until Cape Wrottesly is passed, then steering along the coast of Banks island into Beaufort sea along Mackenzie bay, then along the coast of Alaska to Behring strait. A vessel should be through the passage and on the Pacific side before the 10th of October. Experience has also shown that the earliest time that is safe to pass through Barrow strait, past Griffith's island is between August 26th and September 1st , according to the blockage of ice-floes in that narrow strait, and the season.

Climate slowly becoming warmer.—In another place Captain Bernier writes: "The climate is rigorous beyond what people in other climes will endure, but in my opinion, is improving slowly. Coast lines sheltered from north and east winds are much warmer than the shores exposed to these winds. The farther west our voyage extended, the better the climate became; even in a distance of 36 miles west, the temperature on Melville island was higher and spring about one month earlier than where our ship wintered. I venture the opinion, arrived at by reading of former expeditions and comparing our own experience, that navigation in Lancaster sound, one hundred years from now, will be as easy as it is in Hudson strait."

Return voyage.—On August 3rd, 1909, the Arctic was carried bodily with the ice, before a strong westerly wind, out of Winter harbour. The ship regained Winter harbour which she finally left on August 12th. Byam Martin channel being free of ice on the 20th, the ship steamed north beyond the 76º parallel, when heavy Arctic ice extending across from Cape Hotspin to Melville island formed a barrier to further progress. The ship was moored to the floes and a landing was affected on Bathurst island, which consisted of the same grey sandstone as on Melville island. Cherty particles in the sand on the beach seemed to indicate the nearness of limestone.

Ancient Ice.—The ice across the northern part of Byam Martin channel was old and heavy, floating several feet above the surface of the water. The surface of the ice was very uneven and consisted of a succession of knolls a few feet in height with a billowy surface, characteristic of the ancient ice. The tide at this point was not over a foot in height, and from the appearance of the ice it seemed doubtful if this channel ever open. Between Moore and Baker islands ice was again encountered at noon on the 22nd, and a week was occupied in making the 80 miles through the ice in Barrow strait, some of the floes that filled the channel were five miles in extent. Each flood tide set the ice in motion towards the west, and often carried the ship with it for several miles. Browne island was visited on the 24th. Here some of the pans were old, and all were thickly packed. Several carried loads of earth and stones, and one a piece of the trunk of a tree, about 20 feet in length and 15 to 20 inches in diameter. Griffiths island was passed on the 27th. Wellington channel was reached at noon on the 29th. The western side contained considerable loose ice, but the eastern side and Lancaster sound were entirely free, except for a few bergs which had drifted in from Baffin bay. The first of these, fully 100 feet in height, was aground in Union bay. The first iceberg seen on the south side of the sound was about 20 miles west of Cape Crawford.

Cumberland Gulf.—The Arctic then steamed through the open waters of Lancaster sound, down Navy Board inlet and Eclipse sound to Ponds inlet. From there she proceeded on September 3rd., along the east coast of Baffin land to Clyde river where she met a small Newfoundland schooner S. W. Bartlett, master-charted by Mr Whitney of New Haven. The Arctic then coasted down to Cumberland gulf and reached Kekerton on September 10th; exacting payment of the fishing license from every whaler she encountered. After visiting the mission in charge of Mr. Peck and the whaling station at Blacklead she reached Port Burwell on September 15th. Crossing Hudson strait on the 18th to Big island and Ashe inlet, the site of a former meteorological station she set sail for Belle Isle strait and passing through on September 30th, reached Quebec on the morning of October 5th.

Thus ended a remarkable and valuable voyage which had extended over a period of even fourteen months.

Published report.—A full account of the voyage was published by the Department of Marine and Fisheries at Ottawa under the title: "Cruise of the Arctic, 1908-09".

Cruise of the Arctic, 1910-11.—On the seventh of July, 1910, the Canadian Government dispatched the "Arctic" once more, under the command of Captain Bernier with a party of 36 on board, to the northern waters this time to make, if possible, the Northwest Passage. Sailing up the coast of Greenland, the Arctic passed Disko island on July 22nd in very thick fog and a constant lookout had to be maintened for fear of colliding with the numerous icebergs that were every where about. On July 24, the ship encountered a very large field of ice through which she had to proceed cautiously. After reaching Lat. 76º they saw the coast of Greenland again for the first time in eight days. From here the passage to Ponds inlet was clear of ice and they reached Ponds inlet on the 30th. The steward was dispatched to the village of Ponds inlet with a boat and returned the next day to the ship with five Eskimos and fourteen dogs. The ship was working her way through the ice.

Albert Harbour.—On August 3rd Albert harbour suddenly emptied of ice before the north-west wind and the ship entered and anchored there. At Albert harbour they erected a depot of provisions and during their stay caught a number of salmon at Salmon river.

Western Voyage.—The Arctic left Albert harbour on August 13th, and passing along the east coast of Bylot ran into heavy ice on the 16th, in Lancaster sound, which detained her for 8 hours. They reached Beachey island in the night of the 18th, and anchored, but could not communicate with the shore on account of the ice. The next day they landed provisions over the ice and left a depot at Erebus bay as a base to fall back on in case of need. Bears had destroyed the cache left there on the preceding voyage.

Barrow Strait.—On August 19th they left Erebus bay and continued westward. Barrow strait was full of ice through which the ship made her way slowly past Cornwallis island. Along the coast of Bathurst island there was open water; and a north wind blew the ice southward. She passed the night of the 25th anchored to an ice-floe and the next morning saw Byam Martin island ahead. They were again stopped by the ice, on the 29th they were between Byam Martin island and Melville island and were beset in the ice. On August 30th the passage was clear and they passed Dealy island at noon, and the same night they dropped anchor at Winter harbour, where the strong northwest caused them much diffiiculty in debarking. Another cache of provisions was left at Winter harbour. They could not leave on September 1st as the fog was too thick but the water near Melville was clear of ice. They left Winter harbour at 2 a. m. on Sept. 2nd and, as McClure strait was clear they steamed until mid-day towards Cape Russell on Banks island; when the course was changed as there was a quantity of ice near that shore. They then steamed in a north-westerly direction till late that night when the commander summoned all the officers on the bridge and, pointing to the ice-field ahead, said that it was impossible to continue the voyage further west and turned the ship round towards Melville, after navigating 80 miles of Cape Providence, further west than any ship had been hitherto able to reach, and after having aproximately reached 116° 30′W., and Lat 74° 30′N. When they turned back they were about opposite the Bay of Mercy where McClure had brought his ship in 1851, about the same time of the year, from Behring strait. The order was given to reverse the course and the ship steared for Dundas Peninsula where some men were sent ashore the next morning (Sept. 3rd) to hunt musk-ox of which 23 were killed.

Return from Melville.—The journey eastward was then begun and by Sept. 5th., the ship was between Byam Martin island and Melville surrounded by heavy ice and the weather was cold, and snowing. A polar bear was killed that afternoon, with a strong southwest wind blowing they passed Bathurst island on the 6th, and Cornwallis island on the 7th.

They anchored in Arctic bay, Admiralty sound on Sept. 10th, quite close to the shore in 20 fathoms of water; where the winter (1910-11) was passed. In the fall Mr Morin with Matté and two Eskimos started off for Igloolik, but they only reached Scheming, and returned. The sun sank out of sight on November 6th and did not reappear again until February 5th. The winter was dark and cold and snow fell constantly. The coldest day was 6th of February when the thermometer registerd 55° below zero. Arctic bay is situated in Lat. 73.° 15′N., and Long. 84° W. The new ice formed in the harbour in September, and by the 29th the ice round the ship was a foot thick. On May 27th, 1911 the ice reached its maximum thickness of 56 inches. On July 8th the ship was free of the ice and the anchor was thrown overboard; in the 10th, the ice in the bay was half a mile from the ship. On the 20th the ship left Arctic bay for Ponds inlet and was stopped by the ice in Adams sound. On the 25th the ship in Admiralty Inlet was caught between two large pans that were forced together by a gale and if the ship had not been of the strongest construction she would have been crushed and sunk. On the 29th she was clear of the ice in Admiralty sound and steamed for Ponds inlet, anchoring at Button point on the 31st. The Fog was dense and Eclipse sound was full of ice. Working her way slowly through the ice, the Arctic reached Albert Harvour on August 6th 1910.

Fury and Hecla Strait.—Leaving Albert harbour on August 15th they steamed up Eclipse sound to Koluktoo bay, where some salmon were caught in a seine in the river. They then proceeded up Navy Board inlet to Lancaster sound and Prince Regent inlet. The ship nearly ran on Adams island in a gale of wind at night at the entrance of Navy Board. They were off Cape Kater on the evening of the 17th, were they were prevented by heavy ice from reaching Fury & Hecla strait.

Return voyage.—On the 18th August they turned back from the large island near Aggo and steamed back to Ponds inlet, arriving off Button point on the 21st and nearly ran into a large iceberg in the fog. The voyage was then continued down the east coast of Baffin land through thick fog and through hundreds of huge icebergs and large ice-pans. They reached Kekerton on August 31st and Blacklead, in Cumberland gulf on September 1st. After calling in at Cape Haven, where there is a Scotch whaling station they reached Port Burwell on September 9th and Quebec on the 26th.

Lavoie, Tremblay.—Mr. Lavoie in the spring crossed Brodeur

Peninsula and surveyed the west coast as far as Aggo but did not reach Igloolik. Mr. Alfred Tremblay visited Cape Crawford and Cape Charle York to observe the ice movements.

Stefannsson.—In 1911-12 the Norwegian explorer, Stefannsson, visited and explored Coronation gulf on the north of the mainland.

Algerine.—In June 1912, the Newfoundland sealing steamer, Algerine, an old British slopp of war with a party of gold-hunters on board sailed from St. John's to Ponds inlet where she became beset in the ice of Erik harbour. Capt. Munn, the leader of the expedition went ashore over the ice to hunt and prospect on the neighbouring hills. While he was away the ship was caught between two large pans on July 16th, and her sides were crushed in. Some boats and stores were hastily put out on the içe, but it was thought that when the pans blew apart the ship would float and there was no immediate danger. After being held up by the pans for some three hours the ice began to break and it was seen that the ship was doomed. Everybody on board scrambled hurriedly out on the ice, and in twenty minutes, when the pans opened the ship sank to the bottom. The members of the expedition made their way to the shore over the ice-floes guided by the Eskimos and reached Button point on Bylot island and Albert Harbour where they subsisted on the stores cached by Captain Bernier in 1910-11 at the latter place, unt ilrescued by the S. S. Neptune which arrived on the scene a couple of weeks later. They lost their ship and all their stores, baggage and personal effects when the ship went down.

How the Ice crushes a ship.—"The destruction of a ship between two ice-floes" writes Peary, "is not sudden, like her destruction by a submarine mine, for instance. It is a slow and gradually increasing pressure from both sides, sometimes till the ice meets in the vitals of the ship. A vessel might stay thus, suspended between two floes, for 24 hours-or until the moment of the tides relaxed the pressure, when she would sink. The ice might open at first just sufficiently to let the hull go down, and the ends of the yards might catch on the ice and break, with the weight of the water-filled hull, as the case with the ill-fated Jeannette. One ship in the Gulf of St. Lawrence, was caught in the ice and dragged over the rocks like a nutmeg over a nutmeg grater. The bottom was sliced off as one would slice a cucumber with a knife, so that the iron blubber tanks in the hold dropped out of her. The ship became nothing but the sides and ends of a box. She remained some 24 hours, gripped between the floes, and then went down."

Neptune.—In June 1912 the famous Newfoundland sealing steamer Neptune left St. John's Newfoundland, with another party of prospectors on board under Mr Scott, for Salmon river, Eclipse sound where placer gold was reported to have been discovered by Mr. Janes, a former officer of the Canadian ship Arctic. The Neptune visited Cumberland gulf and then steamed for 700 miles north, along the east cost of Baffin land, continually battling with the heavy ice-floes of the "middle-pack" until she reached Albert harbour, Ponds inlet at the end of July. There she took on board the ship-wrecked members of the Algerine expedition and proceeded to Salmon river, where she too was nearly driven on shore by the pans in a gale. Finding no traces of gold at Salmon river the Neptune visited Arctic bay at the end of August, but could not enter the harbour on account of the ice-pans; so, she steamed back to Button point, where she dropped some Eskimos, and returned to St. John's with the members of both expeditions, 52 persons in all.

Minnie Maud.—On July 29th, 1912, the sailing schooner Minnie Maud 85 tons, commanded by Captain Bernier with a party of nine sailed from Quebec to Ponds inlet, also in search of the rumoured gold at Salmon river. Messrs Tremblay and Reader accompanied the expedition. The schooner spent the winter 1912-13 at Albert harbour and reached Quebec on September 25th 1913, being away fourteen months.

Tremblay's Trips.—During the year Mr. Tremblay made sled excursions for purpose of exploring, trapping, prospecting and hunting all round Eclipse sound, and travelled from Ponds inlet to Igloolik where he discovered an old ice-anchor that had been left by Sir Edward Parry on the island when he wintered there in 1822-23 and the headstone of one of Parry's officers who died there. Mr. Tremblay visited Melville Peninsula and Aggo and returned overland across Cockburn land from Murray Maxwell bay to Ponds inlet. During the year he covered over 4,000 miles on foot in the depth of winter, with the temperature ranging from 30° to 60o below zero and explored and re-mapped some 3,000 miles of coast line and discovered and named many new bays, islands, lakes, rivers and sounds. During his journeys, Mr. Tremblay lived like the Eskimos, on raw, frozen seal, walrus and caribou meat that was often putrid; and had to depend mainly upon his rifle for food and fuel.

Reader.—Mr. Reader in the meanwhile, made a vocabulary of the Ponds inlet dialect; hunted, trapped and prospected round Eclipse sound and Bylot island; and compiled from Mr. Tremblay's notes and sketches and his own, a new map of the North Baffin and Melville Peninsula.

SMITH SOUND AND POLAR RESEARCH

The exploration of Smith Sound, the northern inlet to Baffin bay, was commenced during the search of Franklin.

Inglefield.—In 1852, Captain Edward A. Inglefield left England in auxiliary crew schooner Isabel, with the intention of searching the deep northern inlets of Baffin bay for Franklin, and with the hope of reaching the open Polar sea through Smith sound.

Kane.—American and Scotch whalers had been venturing further north in Davis strait and Baffin bay and Behring sea, but America had taken no active part in polar exploration until the symphaty aroused by the tragic disappearance of Franklin induced Henry Grinnal and George Peabody in 1853 to send out the Advance in charge of Dr. Elisha Kane to search for Franklin north of Smith sound. In spite of inexperience, which resulted in scurvy, fatal accidents, privations, and loss of his ship, Kane's achievements (1853-55) were brilliant. He discovered and entered Kane basin, which forms the beginning of the passage to the polar ocean, explored both shores of the new sea, and outlined what has since been called the American route to the Pole.

Rensslaer bay.—The Advance entered Smith sound on the 7th of August, and, after considerable danger and trouble with ice, was moored in Rensslaer bay on the coast of Greenland, in latitude 78° 40′ and longtitude 70° 40′W., from which she never emerged. This wintering place was nineteen geographical miles further north of the latitude reached by Inglefield in the previous year.

Humboldt Glacier.—Kane confined his explorations to the Greenland side of the sound, and personally reached the southern edge of the great Humboldt glacier, which extends for sixty miles on the east side of Kane basin Dr. Hayes surgeon to Kane, crossed Kane basin to the neighboughood of Cape Fraser and

William Norton, on the Greenland coast, passed the Humboldt glacier and attained Lat. 80° 35' in the vicinity of Cape Constitution, where from an elevation of 500 feet he saw open water in Kennedy channel extending to the north as far as eye could reach. In July 1854, the ice being still firm, and his ship fast in Rensslear harbour, Kane attempted to reach Beechey island, where he knew that assistance could be obtained, but had to return before reaching Cape Parry, south of Whale sound. At the end of August, Hayes and eight others of the crew left the ship with the intention of reaching the Danish settlement of Upernivik, at the southern end of Melville bay; they returned in December, nearly dead of starvation and cold. The vessel was formally abandoned on the 20th. of May, 1855, and on the 17th, of June the boats were launched in open water near Cape Alexander. Cape York was doubled on the 21st of July and the greatly reduced party reached Upernivik on the 6th of August. D.r I. I. Hayes, who had accompanied Kane's expedition as surgeon was the next to attempt to reach the supposed open sea by way of Smith sound. He left Boston in the schooner Unites States, on the 7th of July 1860, and on the 12th of August reached Upernivik where he added six natives to his crew, bringing the total number up to 21. Meeting with a succession of northerly gales off Cape Alexander, Hayes was obliged to water south of Littleton island in Faulke fiord better known as Etah, in latitude 78° 18'N. He first tried to explore the Greenland coast, but was obliged to abandon the attempt on account of the very rough ice. He then determined to cross Kane basin and follow the west coast northward. Thirty-eight days were occupied in crossing the 70 miles between the ship and Cape Hawkes, after which he claims that six days travel brought him to Cape Lieber, situated 170 miles beyond Cape Hawkes. The ship was released from the ice in Etah harbour on July 10th, 1861 and the passage north being barred by solid ice, Hayes crossed to the west side, and explored the coast southward from Cape Sabine to Cape Isabella before returning home. He was thus making good the claim of being the first white man to tread the shores of Ellesmere island; although Inglefield nine years previously had erected a cairn at Cape Isabella.

Long.—In 1867 an American whaler, Thomas Long, reported new land, Wrangell land, about 500 miles northwest of Behring strait, which was hailed by many as the discovery of the edge of a supposed continent extending from Asia across the Pole to Greenland for the natives around Behring strait an Kotzebue sound had long excited explorers by their traditions of an icebound big land beyond the horizon. Such extravagant claims were made for the new land that Commander De Long, U. S. Navy, determined in 1879 to explore it and use it as a base for gaining the pole.

Germania.—In 1869-70 a German North Polar expedition set out the ship Germania, under the command of Captain Koldewey for the north-east of Greenland and explored that coast and valuable scientific observations.

Hansa.—A second German Polar expedition was dispatched in 1869 in the ship Hansa to the north-east coast of Greenland. After calling at the island of Jan Mayen, the Hansa cruched in the ice and sunk on October 16th, 1869. The crew escaped to an ice-flœ on which they drifted in the darkness of an arctic winter for 1300 miles along the coast of Greenland, from the Liverpool coast to Fredericksthaal near Cape Farewell.

Hall.—The next expedition to Smith sound was commanded by Charles Francis Hall, in the Polaris. Hall who was an American, had previously spent two yeors 1862-64 among the natives at Frobisher bay, the charting of which is due to his efforts. On his return from this first trip he went, in a whaler to Rœs Welcome, where he again lived with and like the natives, in the attempt to recover the logs and records of Franklin's ship, the Erebus and the Terror. He remained in that region for four winters 1865-69 before he succeeded in reaching the southern shores of King William island; he was unsuccessful in his quest. Hall throughout his journeys kept a voluminous journal; he took meteorological observations and observations for his position.

The Polaris.—In 1871 the United States government fitted out the Polaris expedition commanded by Hall, with the object of reaching the North Pole. The Polaris left New-York on the 29th of June, 1871, with a crew of 23, which was increased by ten Greenlanders. Melville bay was crossed in 24 hours, and Smith sound being free of ice, an almost uninterrupted passage was made through Kane Basin and Kennedy channel, so that the Polar Ocean was reached on the 31st of August, in latitude 82° 11', to the north-west of Repulse harbour, where heavy, ancient, arctic ice stopped further progress. He had reached a northern latitude never before attained by previous navigators and thus completed the exploration of the outlet which Inglefield and Kane had begun. Returning southward, the Polaris went into winter quarters at Thank God harbour on the Green land side. Hall, in October, reached Cape Brevoort, but died shortly after his return in November from over-exertion caused by a long sledge journey. His explorations, begun so auspiciously, were thus suddenly terminated by his tragic death; and this calamity put a stop to further efforts to reach the Pole. Some explorations were made in the early spring before it was decided to return home.

Weyprecht and Payer.—In 1872-74, Messrs Weyprecht and Payer, the leaders of an Austria Hungary Polar expedition discovered Franz-Joseph Land, which they named after the Emperor of Austria-Hungary. Franz-Joseph Land, which consists of many islands, is situated between latitude 79° and 85° 50' and longitude 42° 64° E, within 500 geographical miles of the Pole, and has, since its discovery, served as the base of many dashes for the Pole. Nansen in 1895, the Duke of Abruzzi and Captain Cagni in 1901 and Andrée in 1897 all started from its northernmost point in their attempts to reach the coveted Pole.

Markham.—In 1874, Lieutenant A. H. Markham of England made a voyage in a whaler to Baffin bay when he made a valuable collection of geological specimens and embodied his experiences in a book.

Sherald Osborn.—In England the very important branch of geographicial research relating to the Arctic Regions was neglected by the British Government during the interval of 10 years (1865-1875) while the Americans, Sweeds Norwegians, Germans, Austrians and English yachts men were making praiseworthy efforts with more or less success. The resumption of English Arctic research on an adequate scale is due to the exertions and arguments of Admiral Sherald Osborn during that period. He set forth the valuable results to be obtained, and the means of success. Basing his arguments on long experience, he showed that it was necessary for success that an expedition should follow the caostline, that it should pass beyond any point previously reached and then winter, and that the work should be completed by sledge parties in the spring. At length, as a result of Sherald Osborn's insistance, an expedition was fitted out on those principles the Smith Sound route was selected, and in May 1875, the "Alert" and "Discovery" sailed from Portsmouth under the command of Captain Nares.

Nares.—In 1875, the British Government fitted out a well equiped expedition with Captain George Nares in command of the

Alert, and Captain Stephenson, second in command, on the Discovery, the complete crew numbeiing 130 officers and men, with three native dogs drivers. The instructions, which were to proceed up Smith sound, indicated that the primary object of the expedition was to attain the highest northern latitude, and, if possible, the North Pole, including explorations to the adjacent coasts, from winter quarters. The ship left England on the 29th of May, and Cape York was reached on the 25th of July, after very little trouble with the ice. Here the first of a series of caches of provisions was established, to provide for the safety of the crews in case they were obliged to abandon the ship and retreat southward over the ice. These caches were not used, and being left for future explorations, were the means of preserving life in the survivors of Greely's party some years later.

From Cape York the passage northward was a constant struggle with immense floe of heavy ice, so that it was the 25th of August before the Discovery anchored for the winter in Discovery harbour. The Albert pushed on, and reached Floeberg beach, in latitude 82º 25′N., and longitude 61º 30′W., where further progress was barred by heavy ancient ice of the Polar sea, to which Nares has given the name poleocrystic, to distinguish it from the ice of more southern waters, which is formed annually. Here the Alert was moored for the winter exposed to the solid action and movement of these solid floes, in a latitude fourteen miles further north than Hall in the Polaris had penetrated four years previously.

Depots of provisions were established during the autumn by sledging parties for use in the following spring. On the 3rd, of April, 1876, seven sleds, manned by 43 men under Commander afterwards Sir Clement Markham, were to push northward over the frozen ocean; the other, under Lieutenant Aldrich was to explore the north coast of Grinwell land.

Markham.—Markham, after great toil and hardships, hauling heavy sledges and boats over exceedingly rough ice, and with five of his 18 men helpless from the effects of scurvy, succeeded in reaching of a point on the ice in latitude 83º 20′ 36″, the further north to that date. The health of the men became worst on the return journey, and if Lieutenant Parr had not, by a forced march of 24 hours, reach the ship for assistance, all would probably have been lost; as it was one died and eleven others had to be dragged to the ship on the sleds.

Aldrich.—Lieutenant Aldrich surveyed two hundred and twenty miles of new coast, reaching, on the 18th. of May, Point

Albert, in 82° 48'N, and 85° 33'W., which was three miles nearer the Pole than Parry's mark made 48 years before. Aldrich's party, also attacked by scurvy, would not have reached the ship without assistance.

Exploring parties were, at the same time, in the field from the Discovery.

Archer.—Lieutenant Archer explored Franklin sound and reached the head of Archer fiord.

Beaumont.—Lieutenant Beaumont left the ship with two sleds and after first visiting the Alert, crossed Robeson channel to Repulse harbour, on the coast of Greenland. He succeeded with one man, in reaching the eastern side of Sherard Osborn fiord, in 82° 20'N., and 50° 45'W., on the 20th. of May. The return was made under distressing circumstances; only Beaumont and one man were free from scurvy when Repulse harbour was reach. The ice in Robeson channel was too rotten to cross with his crew of invalids and but for the timely arrival of a relief party all would have perished two men died, and only with great difficulty did the remainder reach the ship.

Fielden and DeRance.—Captain H. W. Fielden and C. E. DeRance were the geologists of the expeditions and they both contributed valuable reports on the geology of the regions visited.

Ellesmere Land.—The knowledge of Tertiary deposits of each side of Ellesmere is summarized as follows by Dawson: "Small outlying areas of Tertiary (Myocene of Heer) are noted as occuring at Water-course bay, at the entrance of Lady Franklin sound, and two places at the north shore of the sound. Coal is found in these beds in association with black shales and sandstones, and from collections made by Capt. Fillden and Dr. Moss. Prof. Heer describes thirty species of plants closely allied to the Spitzberger flora, and indicating rather colder conditions than are expressed by the character of the Disko island Tertiary plants. The coal appears to be an excellent fuel, containing only 2.01 per cent of water."

Coal.—The coal discovered by the Nare's expedition at Water-course bay is exposed in a ravine for a distance of 200 yards, along the bed of the stream for a distance of 100 yards. The exposed part of the stream was 25 feet thick and how much farther it descended could not be ascertained. The coal was bituminous, of good quality and lay beneath beds of shale and sandstone.

Etheridge.—R. Etheridge contributed a valuable essay on the Palaeontology of the coasts of the Arctic Lands as a result of the expedition.

Scurvy.—Owing to the scurvy, Captain Nares wisely determined to return home. The disease had attacked almost every man of the ships outside the officers, but it is a mystery why it should have played such ravage on an expedition fitted out and provisioned with all possible precautions against the disease; the only explanation given is that the men were over-worked, slept in damp clothes, and were regularly served with a liberal ration of spirits. The Alert left Flœberg beach on the 31st of July, and on the 9th of September both vessels safely reached the open sea, and re-crossed the Arctic Circle on the 4th of October.

Nordenskjold.—In 1878-79, Adol Erik Nordenskjold was the first to achieve the North-east Passage. Step by step energetic explorers, principally Russian, had been mapping the Arctic coasts of Europe and Siberia until practically all the headlands and islands were well defined.

Nordenskjold, whose name was already renowned for important researches in Greenland, Nova Zembla and Northern Asia, in less than two months guided the steam whaler Vega from Tromsœ, Norway, to the most easterly peninsula of Asia. But when barely more than 100 miles from Bering strait, intervening ice blocked his hopes of passing from the Atlantic to the Pacific in a single season and held him fast for ten months from Sept. 28th, 1878, before permitting him to complete his journey.

Exploration in Greenland.—In 1883, Nordenskjold penetrated the interior of Greenland for a distance of 200 miles from Christianshaab on the west coast, and found the interior was entirely covered with a glacier that rose to a height of over 8,900 ft.

Antarctic.—In 1902, Nordenskjold made an expedition to the Antarctic; and in August, 1903, Dr. Charcot went in search of him fearing that he had met with disaster.

DeLong. "Jeannette".—As a result of the discovery of Wrangell land by an American whaler, Thos Long in 1867, Commander DeLong U. S. Navy, determined in 1879 to explore it and use it as a base for gaining the Pole. He entered the Polar sea and his ship the Jeannette was caught in the ice and frozen fast in the pack a hundred miles north-east of Wrangell island in September, and drifted with the ice, in a westerly direction right through the place where the new continent was supposed to lie. For near two years DeLong's party remained helpless prisoners on the ship until in June 1881, the ship was crushed and sank, forcing the men to take refuge on the ice-flœs in mid ocean, near the DeLong islands and about 150 miles north-east of the New-Siberian islands. They saved several boats and sledges and a small supply of provisions and water. After incredible hardships and sufferings, G. E. Melville, the chief engineer, who was in charge of the boats, was rescued on September 26th, and taken to a Russian village on the Lena. All the others perished, some being lost at sea, by the foundering of the boats, while others, including DeLong, had starved to death after reaching the desolate Siberian coast.

Drift of wreckage.—Three years later, in 1884, some Eskimos found washed ashore on the southeast coast of Greenland, near Julianshaab, several broken biscuit boxes and list of stores, which were said to be in DeLong's handwriting. The startling circumstance that these relics in their long drift from where the ship sank had necessarily passed across or very near to the Pole aroused great speculation as to the probable currents in the polar sea, and inspired Nansen to attack the Pole, some years later, from that direction.

Leigh Smith.—In 1880-82 a British expedition under Leigh Smith explored Franz Josef Land.

Greely.—In 1881 the United States Government determined to establish a meteorological station in connection with the international polar stations in the region of Smith . ound—if possible, at Lady Franklin bay. The U. S. Congress voted an appropriation of $25,000.00 for this expedition, a sum ridiculously small, as only $6,000.00 remained after paying for the party to their destination. The expedition was under the command of Lieutenant now Major-General—A. W. Greeley, and was composed of officers and men trom the U. S. Army, none of whom had had previous work in the Arctic work. The party, numbering twenty-six, sailed from St-John's, Newfoundland, in the steam sealer

Protens, on the 4th of July, 1881. At Upernivik two Eskimo dogs drivers were added to their number. Little trouble was experienced from the ice until the ship reached Discovery bay, where the station was to be erected, and after a short delay the party was landed on the 11th of August. Two men found to be physically unfit were sent home with the ship. A house was soon erected, and the observation work carried on regularly during the time that the expedition remained at Fort Conger as the station was called. Extensive explorations were carried out by Greeley on Elesmere land and the Greenland coast, and by his two lieutenants Lockwood and Brainard.

Lockwood.—In the spring of 1882 several sled journeys were made, the most important being that of Lieutenant Lockwood, who crossed Kennedy channel, and passing north-eastward along the coast of Greenland pushed forty miles beyond the farthest point reached by Lieutenant Beaumont of the Nare's expedition, and succeeded in reaching latitude 83– 24'N., the highest attained up to that time.

Brainard.—The Neptune attempted to relieve them during the summer of 1882, but found Smith sound blocked with ice. The second spring and autumn were spent in making expeditions, chiefly in Elesmere land, where Brainard confirmed the discovery of coal by Nares in Lady Franklin fiord. Lieut Brainard described a fossil forest which he discovered in Archer fiord, a few miles west of Cape Baird, which the associated rocks, undoubtedly belong to the Tertiary. Toward the head of Chandler fiord (running west of Lady Franklin sound) he mentions high cliffs of "schistose slate" and in Ruggles river, the outlet of Lake Hazen, large slabs of "slate", which had been used by the Eskimos in building their huts. Brainard speaks of the cliffs of Beatrix bay as dark, those of Ella bay as very light in colour. The bays constitute the termination of Archer fiord. He remembers the cliffs on Muskox valley to have been of dark colours. Respecting Greely fiord, on the west coast of Grinnell land, he quotes from his diary: "On the north shore of this fiord the line of cliffs presents a feature of marked peculiarity, horizontal lines or strata of different colours run uniformly for miles along the face. The predominating colours in those lines and of the cliff was a pale yellow. On the south side, where we were camped, the cliffs were about of the same colour as those spoken of above but the strata was not noticed. They were from 1,500 to 8,000 feet above the sea-level, and presented a castellated appearance. Fossils in great numbers were found here."

Lockwood attempted to pass his previous record, but was prevented by the loose ice and the rugged mountains along the northern coast. As no relief ship arrived and part of the supplies were running short, a retreat was decided upon, and the party started south in the steam launch and two boats, on the 11th of August, 1883. Great trouble was experienced in the heavy ice, and they were obliged to abandon their boats on the 10th of September, after having been beset by the ice for two weeks. Land was reached at Cape Sabine on the 29th of September, where a poor shelter of stones and canvas was erected, in which the party passed the winter. Their provisions comprised the remainder of the provisions taken with them, and a small quantity landed from the Protens after that ship had sunk from an ice rip while trying to rescue them a few weeks earlier in the season. The winter of 1883-84 was passed in great misery and horror. The bulk of their provisions was obtained from the caches left by Nares in 1875. Exposure to the weather had nearly ruined everything left in the caches, but their contents, even in this shape, were of great assistance to these famished men; without them all would have succombed. When help finally arrived at the Cape Sabine camp on June 22, 1883, in the shape of a rescue steamer, only seven of the party had survived, including Greely and they were in the last stages of starvation.

Greely's provisions.—In 1909, Donald B. MacMillan, assistant to Parry's succesful Polar expedition, when making tidal observations at Fort Conger, found some remains of the supplies of the desastrous Greely expedition of 1881-84. They included canned vegetables, potatœs, hominy, rhubarb, pemmican, tea and coffee. Strange to say, after the lapse of more than a quarter of century, many of these supplies were still in good condition and some of them were eaten with relish by various members of the party.

Kislungbury.—One of the finds was a text-book which had belonged to lieutenant Kislungbury, who lost his life with the Greeley party. Upon its fly leaf it bore this inscription. "To my dear father, from his affectionate son". Harry Kislungbury. May God be with you and return you safely to us. "Greely's old coat was also found on the ground. This was also in good condition.

Cape Sabine.—The desolate wind swept and ice-ground rocks of Cape Sabine marks the spot of one of the most sombre chapters in Arctic history. The ruins of the rude stone hut built by

Greely's men during the last year of their lives can still be seen on the bleak northern shore of Cape Sabine, only two or three miles from the extreme point. It is doubtful if a more desolate and unsheltered location for a camp could be found anywhere in the Arctic regions, fully exposed to the biting winds from the north, cut off by the rocks back of it from the rays of the southern sun, and besieged by the ice-pack surging down from Kane basin in the north. The saddest part of the whole story lies in the knowledge that the catastrophe, was unnecessary and, with only a medium of previous Arctic experience, might have been avoided.

Greely when found by the rescue party, was lying inside the wretched hut in the last stage of emaciation and delirium caused by starvation and was chewing on some old shœlaces from a tin, which he kept grasping to his breast and refused to part with, saying. "They are mine—they are mine".

Peary.—In 1886, Robert E. Peary, civil engineer in the United States navy, made a summer excursion to the west coast of Greenland, inland of the island of Disko, and penetrated the ice-capped interior for a distance, due coast, of about 150 miles. Peary's interest had been aroused by reading accounts of explorations made by Nordenskjold in the interior of Greenland.

Nansen.—In 1888, Dr Fridtjhof Nansen, of Norway, crossed the island of Greenland for the first time and found it to consist of a high plateau. 8000 to 10000 feet in height and covered with a perpetual ice-cap. Nansen crossed from Gyldenlove fiord and the east coast to Godthaab, on the west a distance of 250 miles; and took from August 15th to September 25th to accomplish the journey.

Peary.—In 1891, Robert E. Peary undertook his first Arctic journey, with the object of determining the insularity of Greenland and the extent of its projection northward. Mrs Peary accompanied him and during the duration of the expedition presented him with a daughter, who was christened Marie Ahnighito Peary and had the distinction of having the most northerly birthplace of any white child. Peary had his leg broken on the voyage up, through the rudder of his ship, the Kite, becoming wedged by a cake of ice, off the Greenland coast, and the wheel reversing, jammed his leg against the casement. In spite of this accident Peary continued his journey. In the following May of 1892 when his leg was mended, with one companion, Astrup, he ascended the summit of the great ice-cap which covers the interior of Greenland 5000 to 8000 feet in elevation, and pushed northward for 500 miles to Independence bay, which he discovered and named on July, 4th, 1892. On descending from the table land he was surprised to enter a little valley with gorgeous flowers and alive with murmuring bees, where musk-oxen were lazily browsing. Peary returned to McCormick bay across the ice-cap and then, the same year to New-York.

In 1893-95 Peary, started again from McCormick bay, and, sledging over the same route, defined the northern extension of Greenland and conclusively proved that it is an island instead of a continent extending to the Pole. For this and the manful and persistent way in which he overcame all obstacles, Peary deserves the greatest credit.

Peary now turned his attention to the Pole, which still lay 396 miles further north than any point reached by man on the western hemisphere.

From his experiences from his Greenland explorations Peary determined that the best method to reach the desired goal, was to adopt the manner of life, the food, the snow-houses and the clothing of the Eskimos, who by centuries of experience had learned the most effective method of combating the rigors of arctic weather; to utilize the game of the northland, the arctic reindeer, musk-ox etc., which his explorations had proved were comparatively abundant and thus keep his men fit and in good temper with fresh meat through the long, depressing winter months; and lastly to use the Eskimos for his sledging crew.

Nansen.—In 1893, Nansen, the famous Norwegian, who had already crossed Greenland, decided that if he allowed his ship to drift with the ice in the same direction as was followed by DeLong's ill-fated Jeannette, he would be able to reach the Pole. He therefore constructed a unique craft, the Fram, so designed that when hugged by the ice-pack she would not be crushed, but would be lifted up and rest on the ice. He provisioned the vessel for five years and sailing from Tromsoe, Norway, steamed and sailed along the coast of Siberia till he reached the New Siberian islands, where he allowed the Fram to be frozen in near where the Jeannette had sunk, 78o 50'N, 134o E., on September 25th, 1893. When at the end of eighteen months the ship had approached 314 miles nearer to the Pole, Nansen and one companion, Johansen, with kayaks, dogs, sledges, and three months' provisions, deliberately left the ship and plunged northward over the ice towards the Pole, March 14th., 1895. In 23 days the two men had overcome one third of the distance to the Pole, reaching 86o 12′, the farthest north on that date. To continue onward would have meant certain death, so they turned back. When their watches ran down the Providence guided them, and the marvellous physique of both sustained them through fog and storm and threatened starvation until they reached Franz Josef Land, late in August. There they built a hut of stones and killed bear for meat for the winter. In May 1896, they resumed their journey southward, when fortunately they met the English expedition, under Jackson, who was exploring the Archipelago, and were conveyed back safely to Norway.

Meanwhile the Fram, after Nansen left here, continued her tortuous drifting amid the ice-floes. Once she approached as near as 85o 57′ to the Pole-only fifteen miles less then Nansen's farthest. At last, in August, 1896, with the help of dynamite, she was freed from the grip of the ice and hurried home, arriving in time to participate in the welcome of Nansen, who had landed a few days earlier.

Jackson.—In 1894-1897 a British expedition under the leadership of Frederick Jackson explored the Archipelago of Franz Josef Land and was instrumental in rescuing Nansen.

Andrée.—In July 1897 a daring Frenchman named Andrée, with two companions, sailed from Franz Josef Land in a balloon toward the Pole. They were never heard off again, except for three message buoys dropped in the sea a few miles from the starting point.

Wellman.—In 1898 an American, Walter Wellman with Evelyn B. Baldwin sailed from New York to Franz Josef Land and on August 15th. 1899, started from there in a balloon for the Pole, but they were compelled to soon abandon the attempt.

Sverdrup.—In 1898 the Norwegian, Captain Otto Sverdrup, sailed from Norway in Nansen's old ship, the Fram with the intention of exploring the northern part of Greenland, but finding Smith sound blocked with ice, was obliged to pass the winter of 1898-99 at Cape Sabine, where Greely's party passed their last winter. In the spring, parties from the ship explored Hayes sound and crossed Ellesmere island to its west coast. In 1899 Smith sound continued closed, and Sverdrup returned south with the intention of exploring Jones sound. Taking the Fram up that channel, he went into winter quarters at Haven fiord on the north side of Jones sound. During the spring 1900 two long sled journeys were made to the north and west occupying 76 and 90 days respectively. Sverdrup discovered, traced and named Ellef Ringnes and Axel Heiburg islands and traveled through Nansen and Eureka sounds and mapped and explored Jones sound and the western side of Ellesmere island.

Grinnell Land.—The Fram broke out of winter quarters on the 9th of August, 1901, and proceeding westward, and passing out of Jones sound, was beset off the north coast of Grinnell Land until the middle of September, when she was again released, and reached winter quarters at Belcher channel. In the spring of 1902 two long journeys were again undertaken by Sverdrup and Isacksen involving important discoveries. On these trips he discovered two other large islands in latitude 79°, extending westward to longitude 106 W., which is that of the eastern side of Melville island, while North Cornwall and Findlay islands were seen to the south. To the westward and northward no signs of land were seen, and the ancient Arctic ice was found pressing on the coasts of these new northern islands, so that the drift line of pressure can now be traced from Behring sea to the east coast of Greenland.

The fourth winter.—The Fram could not be released from the ice in 1901 and a fourth winter had to be faced. Sverdrup made his longest and most important journey in the spring of 1902, where his companions were making minor trips. On the 6th of August 1902 the Fram was released, and returned to Norway, after having completed the exploration and mapping of the last of the Arctic islands discovered up to that date.

Melville, Bryant Casks.—In the summer 1899 some casks, specially constructed to withstand the enormous pressure of the ice, were set adrift of Cape Barrow, Alaska with the object of ascertaining the rate and direction of the ice across the Polar basin. One of these casks after a supposed drift across the regions of the Pole and between the north coast of Greenland and Spitzbergen drifted ashore near Cape Randagnupe on the east coast of Iceland in 1905, having taken six years to accomplish a distance of 3500 miles, an average rate of a little more than a mile and a half a day. A record cask followed the same mouth apparently until off Prince Charles Foreland on the west coast of Spitzbergen, when influenced doubtless by the Gulf Stream, drifted to the east and south of Spitzbergen till it was picked up near Hammerfest, on the north coast of Norway, on November 3rd, 1908, having taken over ten years to cover a distance of some 3000 miles; an average drift of about three quarters of a mile a day.

Undiscovered Lands.—The conjectural course of the drift of these casks and of the relics of the Jeannette and of the Fram, effectually disposed, in the minds of many of the theory of the existence of any very considerable land mass in the centre of the unexplored Polar ocean in the vicinity of the Pole. As the Eskimos of Behring strait and Kotzebue sound have often spoken of their traditions of an ice-bound big land beyond the horizon; and the Melville Bryant casks may have been carried westward for a long distance round this coast to the neighbourhood of the De Long islands, when they fell in with the same current that bore the Fram and the relics of the Jeannette towards the Greenland Sea; and this would account for the number of years that they took to reach the end of their long voyage in the polar ice.

First Polar Expedition.—Peary in his first north polar expedition, which lasted for four years, 1898-1902, Peary failed to get nearer than 343 miles to the Pole. Each successive year packs of ice blocked the passage to the polar ocean, compelling him to make his base approximately 700 miles from the Pole, or 200 miles south of the headquarters of Nares, which was too great a distance to be overcome in one short season. During these years none of the ships engaged to take supplies to him were able to penetrate more than the southern portion of Smith sound, and consequently Peary had to hand all his provisions and outfit over the very rough ice in dog-sleds two hundred miles before he arrived at the original starting point of Beaumont and Lockwood. This was a handicap of the severest description. During this trying period, he explored and mapped hundreds of miles of the coastline of Greenland and of the islands west and north of Greenland.

Abruzzi and Gagni.—In 1900 Italy made a bid for the Pole when the Duc d'Abruzzi in Stella Polare, captained by Captain now Admiral Cagni, sailed from Franz Josef Land. The Duc d'Abruzzi, a member of the Italian Royal Family was the leader of the expedition, and on April 25th, 1901. Cagni reached 86o 34′ and won from Nansen for the Latin race the honor of the Farthest North. Captain Cagni reported that the ice at that point was so smooth and level that if he had had an automobile he could have reached the Pole.

Farthest North.—On April 21st 1902 Peary reached Latitude

84° 17' on the ice of the Polar ocean, some 40 miles further than Markham's "farthest north" in 1876.

Second Polar Expedition.—For the next attempt in 1905 Peary designed and constructed the Roosevelt for the purpose of forcing the passage through the resistless flœs of Kennedy channel and succeeded in pushing his ship up to cape Sheridan on the northeast of Grant Land, and on the very edge of the ice-laden Polar ocean. Here they spent the winter and the next spring. April 21st 1906, Peary reached 87° 7', a new world's record. It was a season of unusually violent and continued winds, and these disrupting the ice-pack, separated Peary from his supporting parties, and opened big "leads" or channel of open water in the ice-flœs. Peary having insufficient supplies was compelled, when almost within striking distance in latitude 87° 6' only 154 geographical miles away from the Pole, to abandon the attempt and being threatened with starvation, to return to Cape Sheridan. In doing so he and the rest of his party nearly lost their lives when the Big Lead at the edge of the Continental Shelf opened up a wide channel between them and the land. In returning the eastward drift of the ice carried them off their course and they landed on Markham island, at the north-end of Greenland and they rejoined the ship at Shelter river. Captain Bartlett, the master of the Roosevelt had in the meantime, tried to drive the ship south from her exposed position at Cape Sheridan to a more sheltered place in Lincoln bay, where it had been agreed Peary was to rejoin her. At Shelter river, the Roosevelt had been caught between the moving pack and the vertical face of the ice-foot receiving an almost fatal blow. She had been lifted bodily out of the water, the stern-post and rudder smashed into kindling wood, and a blade ripped off the propeller. When the pressure of the ice was partically released the ship was floated. But she lay there nearly a month, and twice during that time even the rigging of the ship was landed, when it seemed impossible that she could survive. A new rudder was improvised, and the crippled and almost helpless ship floated around into Lincoln Bay whence she finally limped home to New-York.

Harris' report.—R. A. Harris of the United States Coast and Geodetic Survey writes as follows on this subject in Appendix I of Peary's book "The North Pole": "The range and time of occurrence of the diurnal tide at Point Aldrift (Grand Land) do not differ greatly from their equilibrium values based upon the assumption of a deep polar basin extending from Grant Land and the Arctic Archipelago to the marginal waters off the portion of the coast of Siberia lying east of the New Siberian Islands. But De

Long's party observed tides at Bennett Island in 1881. From these observations it is seen that the diurnal tide has a much smaller range than would be permissable under the hypothesis of deep water in the portion of the Arctic Basin just referred to. The diurnal tides at Pitlekaj, Point Barrow and Flaxnan island are, as noted below, also too small to permit of this hypothesis. The smalless of the diurnal tides in the cases cited can probably be explained on no other assumption than that of obstructing land masses extending over a considerable portion of the unknown region ot the Arctic Ocean.

"No further effort will be made here to prove the necessity for a tract of land, an Archipelago, or an area of very shallow water situated between the present arctic Archipelago and Siberia. A brief discussion of this question together with a tidal map of the Arctic Regions, will be found in a paper about to be issued by the Coast and Geodetic Survey and which has already been referred to. A few pertinent facts may, however, be mentioned.

(1)—At Point Barrow, Alaska, the flood stream comes from the west and not from the north, as the hypothesis of an extensive deep polar basin implies.

(2)—The semi-daily range of tide at Bennett Island is 2.5 feet, while it is only 0.4 foot at Point Barrow and 0.5 foot at Flaxman Island, Alaska. This indicates that obstructing land masses lie between the deep basin or channel traversed by the Fram and the northern coast of Alaska.

(3)—The observed tidal hours and ranges of tide show that the semi-daily tide is not propagated from the Greenland sea to the Alaskan coast directly across a deep and uninterrupted polar basin.

(4)—The observed ranges of the diurnal tides at Teplitz Bay, Franz Josef Land; at Pitlekaj, north-eastern Siberia; and at Point Barrow and Flaxman Island have less than one half of their theoretical equilibrium values based upon the assumption of an uninterrupted and deep polar basin.

In addition to these facts are the following items which have a bearing upon the shape and size of this unknown land.

The westerly drifting of the Jeannette.

The westerly drifting north of Alaska observed by Mikkelson and Leffingwell.

The shoaling indicated by a sounding of 310 fathoms taken in Latitude 85o 23′N.

The eastern progression of the tide wave along the northern coast of Grant Land as shown by observations at Point Aldrich, Cape Sheridan, and Cape Bryant.

The great age of the ice found in Beaufort Sea.

Items of some importance in this connection, but which cannot be regarded as established facts are:

The probable westerly courses taken by casks set adrift off Point Barrow and off Cape Bathurst, the one recovered in the north-eastern coast of Iceland, the other on the northern coast of Norway.

The question suggested by Harrison whether or not enough ice escapes from the Arctic to account for the quantity which must be found there if one were to adopt the assumption of an unobstructed polar basin.

Taking various facts into consideration, it would seem that an obstruction (land, islands or shoals) containing nearly half a milion Isquare statute miles probably exists. That one corner lies north of Bennett Island; another north of Point Barrow; another, near Banks Land and Prince Patrick Island; and another northouest coast of Grant Land.

It is to resolve these problems that the exploring expedition of Stefannsson north of the Mackenzie river, and MacMillan, at Smith Sound.

Ziegler Fiala.—In 1903-05 the American Ziegler Polar expedition sailed from New-York under the leadership of Anthony Fiala and made their headquarters at Franz Josef Land.

Orleans-Belgica.—In 1905 the Duke of Orleans organized a Belgian Polar expedition and sailed in the ship Belgica to the north-east coast of Greenland. They reached Cape Bourbon in Lat. 79º, long. 20–W., and explored a portion of the Greenland coast, which they style Duke of Orleans Land.

Dr Cook.—In 1907-08-09, Dr Frederick A. Cook, in the yacht Bradley, from New-York, landed at Anoritok (Eskimo-place of Wind), a bay just north of Etah, and with two young Eskimos for his sole companions sledged across Ellesmere land into Bay Fiord, Eureka sound and then up Nanson strait northward along Crocker Land, which had first been viewed by Peary and Cook in 1906. Dr Cook had accompanied Peary as his medical assistant in 1906 and had then gained a good knowledge of the country and the requirements of Arctic travel on that exciting and adventurous voyage. Cook made his preparations for his journey to the Pole with the most minute attention to detail everything in the shape of provisions and equipment were in the most concentrated form,. His sleeping bag was of the lightest and warmest—the woolly skin of a young musk-ox with a guilt of eider down feathers inside—and he took along with him the necessary instruments, sextant, compass and chronometer to determine his direction latitude and longitude by the sun and Greenwich time. Cook had previously morgaged his home in Brooklyn to raise enough money for his equipment and a friend had lent him his schooner to convey him to Etah. Cook was a man of unflinching courage and determination and Peary spoke of him in 1906 in the highest terms—as a man made of the very stuff to reach the Pole. It certainly required desperate courage for a man to risk his life and fortune on a march of 1800 miles from his base at Anoritok to the Pole and back, half of which lay over the treacherous ice-pans, thin ice and ever opening and closing "leads" of the Polar ocean: the more so, as, save for his two inexperienced Eskimos, with their sledges and dog teams, he had no one to depend on but the guiding and helping hand of Providence and his own endurance, determination and resource. Cook Cook on his return claimed to have reached the Pole, or its vicinity, on or about April 20th, 1908, just one year before Peary and this was accepted as correct until Peary returned in 1909 and denied the truth of Cook's statements. Peary stated that he had proof from the Eskimos of Etah that Cook was never in that vicinity. A heated discussion in the newspapers followed, as each had their partisans when Cook, being unable to produce documentary proof of his bearings and in relation to the Pole, was discredited and Peary was acclaimed the victor. Cook claimed, in defence, that he had lost his instruments and notebooks and accused Peary of having tempered with his stores and of having with the aid of his powerful and wealthy associates in New York, instituted a campaign of persecution and calomny against him for the sole purpose of discrediting him and awarding the palm of the Polar discovery to Peary.

The true merit of the dispute owing to the impossibility of production of proof on either side may never be known ; When he returned he was, as occurred with Peary in 1906, carried eastward by the drift of the ice and reached Etah after crossing on foot the mighty Humboldt glacier for a distance of over 200 miles, a feat never before accomplished, although several times attempted. Cook returned to Etah and, from there, made his way along the Greenland coast and across the glaciers that line the shores of Melville bay to Upernivik; a distance of over 800 miles and constituting one of the most ardous and difficult trips ever recorded. In the summer of 1909 Dr Cook was conveyed from Upernivik by a Danish vessel to Copenhagen, where he was accorded a royal welcome by the King of Denmark and by the Royal Geographical Society of Danmark and was hailed by the entire world as the Discoverer of the Pole; until Peary returned in September and denied Cook's story and claimed the Pole for himself.

Dangers of Glacier travel.—The perils of glacier travel are well-known to all Alpine climbers and travellers in the Arctic, but the following description of the fate that befell Lieut. R. E. S. Nivinis of the British Royal Fusiliers who accompanied Dr Mawson's Australian Antartic Expedition, 1911-14, will give an appreciation of the risks run by Dr Cook, when he traversed the Humboldt glacier.

Mawson.—Dr Douglas Mawson gives the following account of the death of Ninnis:—"My companions were Lieutenant B. E. S. Ninnis, of the Royal Fusilliers and Dr Xavier Mertz, an expert Swiss ski runner. The object of the dash (inland from Emmons in Wilkes Land) as far as east as possible was to ascertain the nature of the land in the direction. We were assisted by 16 dogs in dragging a load of 1700 pounds.

"The morning of December 14th found us in latitude 68° 53′S., and longitude 151° 35′E, having covered a distance of 311 miles. The track had laid over plateau heights and crevassed glacial depressions, three of which were encountered aggregating 9000 feet in ascents and as much in descents. All were in high spirits. All trouble seemed then at an end, as we had arrived on an unbroken plateau with a clear sweep of coast to the east, and it was intended to keep the track at a safe distance to the south of the crevassed coasted downfalls. December 14th was a beautiful day. We were just reveling in it when calamity overtook us. Mertz on his ski as a trail braker was a quarter of a mile in advance of myself and the first dog team. Close behind came Ninnis, with a select team of dogs dragging a sledge, on which was packed, mor e vital necessities. This arrangement had been adopted because it was thought that if anyone was to suffer by crevasses it would be the first sledge. Believing we were outside the danger zone, I was greatly surprised to observe the faint outline of a crevasse crossing. Mertz had crossed without regarding it as specially dangerous. My team was on top of it before being aware of the fact, but I was not specially anxious as I had already negociated scores of them. However as was the custom, I called back from the crevasse to put Ninnis on his guard. Looking behind, soon after, what was my astonishment when nothing met my eye, but the great expanse of snow and ice. Where, then were Ninnis and his team? Then the possibilities of the crevasse dawned upon me.

"Hastening back, we came to the yawning abyss. As our eyes became accustomed to the dark blue light from below an injured dog was observed caught on a ledge, and he presently began to moan. Some other fragments were also observed at the same spot, but no trace of our comrade. He must have gone down to where we knew not, but certainly to instantanous death.

"We called for hours without getting any answer. The dog ceased to moan and an eerie stillness rose from the depths. All the rope left was of no avail to reach the ledge, 150 feet below, where the remains of the dog and a few scraps might have been secured, any of which would have been of great value in the position in which Mertz and I were left. The remaining sledge had only one and a half weeks man's food and no food at all for the six woefully emaciated dogs. There was saved a spare tent cover and a frame was improvised by using a pair of skis and the theodolite legs. Later on a broken spade was picked up at an old camp. We decided that eating the dogs we would have meat enough to reach the hut across the plateau. The sea ice was breaking up. Nine hours after the accident, I read the burial service and we started to return.

"The food was apportioned on a mileage basis, but owing to delays caused by bad weather the ration was reduced. The dogs gave out daily, and soon none was left. There was no nutriment in their flesh and no marrow in their bones. Early the first week in January, we arrived 500 miles from the hut. Our alimentary systems were affected by the short ration. Mertz was worse than I, and very weak. The weather was abominable. Day after day there was dense falling and drifting snow. The cold struck home as it never does when one is in good condition. The stages of a few miles were covered with great difficulty. On January 3rd, it became evident that my comrade's condition was worse than my own. Even the best food we had did not have the effect expected Meitz was very cheerfull and I could not have wished for a better companion. The same applied to Ninnis, both were fine characters.

"The weather became a little clearer on January 6th*t* but, owing to the slippery surface, falls were continuous. It soon became evident that Mertz could not proceed on foot. With him on board the sledge, even with the help of a sail, progress was slow, and much toil resulted in two and a half miles, only being recorded on the meter. It was possible to steer only a very rough course in the drift. On the morning of January 7th, Mertz's condition grew much worse, and about midnight. January 7th, he passed away. My own condition was such as to hold out little hope, but I determined to push on to the last.

"Of the month that followed, which was consumed on the one hand by a close fight with starvation and on the other with a war upon the miles that lay ahead, I do not wish to be reminded. It snowed and drifted every day. As I crossed cravassed glaciers I fell in the length of the rope several times. I had miraculous escapes from these falls, and I was so weak I could scarcely climb out by the rope. My skin, hair and nails came off. Unexpectedly I found a food cache left by a search party and reached the hut eventually."

The Mawson Expedition.—The Mawson expedition was made possible by the subscription of $100,000.00 contributed largely by the public of Australia, although $50,000.00 was subscribed in three days through an appeal by Sir Ernest Shackleton in the London Daily Mail. In addition several British firms contributed supplies and equipment worth about $10,000.00. The chief object of the expedition was to explore 2000 miles of coastland facing Australia. The explorers took along complete wireless apparatus and erected stations at Mc Quarrie island and Adelie Land, so that they could keep in regular communication with Hobart, Tasmania. The expedition consisted of 50 men, 32 sledges and a pack of well-trained Greenland dogs under the leadership of Dr Douglas Mawson. Oceonagraphic investigation carried out by the ship Aurora, under Captain Davis, in the depths between Australia and the Ant-Arctic continental shelf, by means of soundings and trawlings, was successfully conducted to a depth of two miles and through fifty-five degrees of longitude. The land was followed through 33 degrees of longitude, 27 of which were sledged over. Journeys were made over sea-ice and a plateau never before sledged over, at a main base aggregating 2400 miles and a western base of 800 miles, not including journeys, supporting parties or relay work.

Wilkitzki.—On June 10th, 1913 Commander Wilkitzki sailed from Vladivostock with the ships Taimyr and Waygatch on a russian Polar exploration. The ships sailed by way of Petropovolok and East Cape through Behringstrait into the Polar ocean. The expedition then sailed westward along the Siberian coast to Lat. 81o N., and Long. 104 E., where they discovered a new land consisting of high volcanic peaks, one of which, some distance inland, seemed recently alive, as what seemed to be vapour was seen rising from it. This new land was opposite Cape Chelyuskin, on the coast of Siberia. The expedition landed on the coast, which Commander Wilkitzki reported as being rocky with high, abrupt cliffs formed evidently by volcanic activity. The temperature of the water near the shore was 51.8 degrees, Fahrenheit, while the temperature of the water on the shore was 62.6 degrees. The land was covered with snow almost to the sea. In July and August, the expedition saw considerable evidences of the presence of reindeer on the land. Many walrus were seen and bird life was plentiful. A number of Polar bears were also noticed. The vegetation was scanty. Twenty fathoms from the shore a depth of 95 fathoms was obtained The expedition cruised north-westerly along the margin of the land to Lat. 81o N., Long. 96o E., and was then forced to turn away from the land, which continued in a north-westerly direction, by the solid ice-pack. The expedition then followed the shore-line in a south-easterly direction as far as was possible, but, in latitude 76o 40′N., were forced away from the land by the ice; and then they travelled east-ward to Becett Jeannette and Henrietta islands, the location of which was accurately taken. Wilkitzki found that Becett island had been placed too far north, and De Long island is much smaller than had been formerly reported. The new land he called Nicholas Second Land in honour of the Czar of Russia. No evidence of mineral was found there; and as the Fram drifted north of Nicholas second Land, without discovering it, it is probably an island of moderate dimensions.

Open water.— Commander Wilkitzki reported that the voyage in the Arctic Ocean, in the months of July, August and September, was exceptionally pleasant. The only ice-packs met with during the westward voyage was south of Wrangel island, in the neighbourhood of Lat. 71o N., Long. 180o E., and along the shores of Nicholas Second Land.

Heavy gale.—When returning by way of Behring strait on October 3rd, the ships encountered the most severe gale ever experienced by the officers. The gale continued to rage with great violence until October 7th, and they were compelled to take refuge in the harbour of St. Michel in Alaska, which they reached on October 9th and from which point they telegraphed the news of their discoveries.

MacMillan.—In 1913-14 Donald B. MacMillan, who accompanied Peary when he discovered the Pole in 1909 sailed for Smith sound with the object of exploring Crocker and Bradley land, west of Ellesmere island. MacMillan was equipped with a wireless outfit which he proposed erecting at his base in Smith sound, with which he could keep in constant communication by means of another field equipment, and if possible with the Belle Isle wireless station.

The preceding summary gives only an adequate conception of the immense amount of money and lives that have been expended by the nations to explore the northern ice world and to attain the northern apex of the earth.

Still work for the explorer.—In this rapid and perfunctory sketch of the history of geographical discovery, the labours of numerous explorers have been enumerated; but its perusal will show that notwithstanding all this work, there is much remaining to be done. Vast areas around both poles, and in the interior of Asia, Africa, South America and New Guinea, are still unknown, even more extensive regions have only been partially explored, and millions of square miles remain to be surveyed before the work of the geographer is complete.

The North Pole

The struggle for the North Pole began some four hundred years ago when Sebastien Cabot reconnoitred Davis strait in 1497 in search of a North-west passage to India and China for King

Henry VIII of England. Sinçe then hundreds of venturesome spirits and hardy navigators, British, Scandinavian, French, Dutch, German, Russian, Italian, Belgian and American, have risked and, in many cases lost their lives in an attempt to force a passage through the frozen seas, across the Pole, to the wealth of China and the Indies. In 1554 the heroic Willoughby, discovered Nova Zembla and died of starvation; in 1588 John Davis rounded the southern cape of Greenland and followed the western coast northward for 800 miles and gained for Great Britain the record of the farthest north, at that time, by reaching 72º 12′, a point only 1128 miles from the geographical North Pole. William Baffin, another Englishman in 1616 eclipsed Davis record when he reached the 78th parallel and discovered Smith sound, only 700 geographical miles in a direct line from the Pole; while Henry Hudson, a few years before, had navigated his ship through the ice round Spitzbergen and pushed his way north to 80º 23'. Hudson's record remained unequalled for 165 years until J. C. Phipps in 1773 accompanied by Nelson afterwards the hero of Trafalgar, surpassed it by 25 miles. In 1819 William Edward Parry was the first to pass directly north of that Magnetic Pole and to pass the 11th. meridian west of Greenwich; and in 1827, leaving his ship at Spritzbergen, Parry reached, over the ice, latitude 82º 45'N., 435 grographical miles from the Pole. In 1871 an American, Charles Francis Hall sailed his ship through the terrible ice-flœs of Kane basin and Robeson channel to 82º 11′, when his death checked further progress.

In 1875 Aldrich of the British Nares' expedition reached 82º 48 on Grant Land, which was three miles nearer the Pole than Parry's mark made 48 years before, and the following spring Clements Markham gained 83o 20′ on the Polar ocean, the farthest north yet attained and only 380 geographical miles from the Pole. In 1882 Lieutenant Lockwood of the American Greely expedition reached 83o 24′N, bettering Markham's record by four miles and wresting from Great Britain for the first time in 300 years the record of Farthest North.

Nansen.—In 1895 the dauntless Norwegian, Dr Nansen, leaving his ship the Fram beset in the ice, reached 86o 12′. only 228 miles from the Pole, and established a new record of "farthest north". In 1901, Nansen's record was surpassed by the Italian Captain Cagni of the Duc d'Abruzzi's expedition, who reached 86o 34′, twenty-two geographical miles nearer the Pole than Nansen's record.

Peary.—But the final triumph was reserved for America, when

Commander Robert E. Peary, a civil engineer of the United States navy, hoisted the American flag at the Pole on April 6th, 1909 for the first time in the history of the world, and only two and a half years before Roald Amundsen and Robert Scott had shared the honours of planting the flags of Norway and Great Britain on the South Pole.

Peary was in his fifty-third year when he discovered the Pole and had spent 23 years of his life in Arctic explorations in Greenland and, since 1898, had made three previous attempts to reach the Pole. On his first attempt he only came within 343 miles of the Pole; on April 21st, 1902 he reached 84° 17′ which was some forty miles nearer than Markham's record in 1876. On April 21st 1906 Peary forced his specially constructed ship, the Roosevelt, to Cape Sheridan, Grant Land, in Lat. 82° 30′N., and leaving the land at Cape Hecla, 45 miles northwest of the ship, reached the unprecedented latitude of 87° 6′, only 174 miles from his goal when through scanty provisions and the opening of enormous channels of water in the ice-floes, he was forced to return to his ship, which he reached after the greatest difficulty, dangers and sufferings and when he and his party nearly lost their lives.

Last and Successful.—Underterred by his previous failures Peary, with the assistance of wealthy friends in the United States, again outfitted his ship, the Roosevelt, in 1908 and after the minutest attention to details in the matter of equipment, sledges, cooking stoves, clothing and personnel, sailed from New-York in July 1908 and from North Sydney, Cape Breton on July 17th, on his last, and as it proved, successful quest of the Pole.

Party.—The expedition comprised 22 men including the crew of the Roosevelt, who were Newfoundlanders commanded by Captain Robert A. Bartlett. His assistants were Messrs Marvin, Dr Goodsell, MacMillan, Borup and Mathew A. Hanson (negro).

Supplies.—The supplies for the ship on the voyage and when in winter quarters included, flour, coffee, tea. sugar, kerosene, bacon, biscuit, condensed milk, pemmican, dried fish and smoking tobacco. They relied on killing enough walrus, caribou and musk-ox to supply them with fresh meat for men and dogs. A pianola, books, gramophone and magazines were also supplied to provide amusement during the long winter months.

Outfit.—For work in the field special outfits were provided in the matter of sledges, tents, observation instruments and soundings apparatus, arms and ammunition, alcohol and Kerosene stoves and provisions.

Field provisions.—The field provisions consisted of pemmican, tea, ship's biscuits and condensed milk. Pemmican is a prepared and condensed food, made from beef, fat and dried fruits. It may be regarded as the most concentrated and satisfying of all meat foods, and is the best form of nourishment for sledge work in the Arctic.

Sledge.—The Peary sledge was twelve to thirteen feet in length two feet in width, and seven inches in height; the runners curved at both ends, in front and behind, with two inch wide bent ash runners attached, the runners being shod with two inch wide steel shœs. The sides of both runners were solid and were lashed together with sealskin thongs. Two strong upstanders of wood were attached at the rear end, with a cross-bar, for guiding the sledge. On a level surface this sledge will support ten or twelve hundred pounds. The dogs are attached to the sledge fanwise, as is the Eskimo custom; and the standard team is eight dogs; although for rapid travelling with a heavy load, ten or twelve are often used.

Harness.—For dog harness Peary adopted the Eskimo pattern, consisting of two loops joined by a cross strip at the back of the neck and under the throat, made of special webbing or belting; about two and a half inch in width, with a braid linen sash cord for a trace. The dogs forelegs pass through the loops, and the ends are joined over the small of the back, where the trace is attached. This harness is very simple and flexible and has the advantage over sealskin that the dogs won't eat it when hungry in camp.

Load.—The sledges were loaded as follows: On the bottom was a layer of dog pemmican in red tins, covering the entire length and width of the sledge; on this were two tins of biscuit, and crew pemmican in blue tins; then the tins of alcohol and condensed milk; a small skin rug for the men to sleep on at night in the igloo, snow-shœs and spare foot gear, a pick-axe and a saw-knife for cutting snow-blocks and few extra pairs of Eskimo sealskin boots. An alcohol-stove, specially designed by Peary completed the outfit. Compactness was the main idea and keeping the centre of gravity as low as possible in order to prevent the sledges from overturning.

Rations.—The daily ration, when sledging to the Pole, consisted of:—one lb pemmican, one lb ship's biscuits, 4 oz condensed milk, ½ oz compressed tea, 6 oz liquid fuel, alcohol and petroleum. A total of 2 lbs 4½ oz, of solids per man per day. It was found that on this ration a man could work hard and keep in good condition in the lowest temperatures for a very long time; and that no other food item, either for heat or muscle building, was needed.

The daily ration for the dogs was one pound of dog pemmican.

Kitchen-Box.—The kitchen-box for the sledge journeys con sisted of a wooden box containing two double burner oil stoves' with four inch wicks. The two cooking pots were the bottoms of five gallon coal-oil tins, fitted with covers. When packed they were turned bottom side up over each stove, and the hinged cover of the box closed. By this water-boiler they were enabled to melt ice and make tea in ten minutes; which on previous journeys had taken an hour. The stimulous of tea is a necessity in Arctic travel and by this simple device Peary saved one and one-half hours each day when travelling to the Pole. On reaching camp, whether tent or igloo, the kitchen box was set down inside, the top of the box turned up to keep the heat of the stove from melting the wall of the igloo or burning the tent; the hinged front of the box was turned down and formed a table. The two cooking pots were filled with pounded ice and put on the stoves; when the ice melted, one pot was used for tea, and the other to warm beans or boil meat. Each man had a quart cup for tea, a hunting knife and a teaspoon. Two meals a day, one in the morning and one at night, was the rule, wherever possible, although sometimes they travelled twenty-four hours without stopping for food. On the trip to the Pole they did not carry oil-stoves at all , except some small ones with two inch wicks, which were used for drying mittens.

Tent.—The tents were especially made of lightweight canvas, with the floor of the tent sewed on to it. The fly was sewed up a circular opening cut in it, just large enough to admit a man, and the opening fitted with a circular flap which was closed by a draw-string, making the tent absolutely snow-proof, as an ordinary tent, when the snow is flying, would soon be filled. The tent was pyramidal in shape, with one pole in the centre, and the edges were usually held down by the sledge runners or by snowshœs used as tent-pegs. The men slept on the floor in their skin clothes, with a musk-ox skin under, and a light deer skin over them. Peary did not use sleeping bags since his Arctic trip of 1891-92 owing to the danger of the ice opening under the floor of the igloo and letting them into the water, when a man in a bag would be helpless. He always, when camped on the ice of the ocean slept in his clothes with his fur mittens on his hands, so as to be ready for any emergency that might happen in the night.

Instruments.—The instruments used in taking the observations for latitude were a sextant, an artificial horizon and a small theodolite; although the latter was not used owing to the low altitude of the sun. Had the expedition been delayed until May or June, the theodolite would have been of value in determining position and variation of the compass. The artificial horizon consisted of a specially designed wooden trough filled to the brim with mercury, previously warmed in the igloo, and covered with a metal-framed roof carrying two pieces of very accurately ground glass, set inclined like the roof of a house. The object of this roof was to prevent the slightest breath of wind from disturbing the surface of the mercury and so distorting the sun's image in it, and also to keep out any fine snow or frost crystals. By the use of this mercury trough it was possible to bring the mercury very close to the edges of the trough and so to read angles very close to the horizon.

Observations.—In taking an observation the instrument box was firmly unbedded on the level in the snow which was tramped down and packed firmly round the box. Then a skin was thrown down on the snow to shield the observer from the sun's glare, and to prevent the sun's warmth from melting the snow and altering the bearing of the box. If there was any wind, a wind shield of snow-blocks was raised to windward. In placing the mercury trough and roof on the box, the longest diameter of the trough was directed towards the sun. The observer then lay down flat on his stomach on a skin placed on top of the snow, with his head to the south, and with the sextant grasped in both hands, and resting on his elbows, moved his head and the instrument until the image, or part of the image of the sun could be seen reflected on the surface of the mercury.

The latitude of the observer is equal to the distance of the centre of the sun from the Zenith, plus the declination of the sun for that day and hour, which may be obtained for any place at any hour from tables prepared for that purpose, and which give the declination for noon of everyday in the Greenwich meridian, and the hourly change in the declination. Declination tables with tables for refraction to minus 10° Fahrenheit, were obtained from the Nautical Almanac and Navigator.

A compass, barometer, chronometer for calculating the longitude west of Greenland were also included.

Sounding apparatus.—A part of the scientific work of the expedition was a series of deep-sea soundings from Cape Columbia to the Pole. The sounding apparatus comprised two wooden reels of a length equal to the width of the sledge, a detachable wooden crack to go on each end of the reel; to each reel a thousand fathoms (6000feet) of specially made steel piano wire of a diameter of .028 inches, and one fourteen-pound lead having at its end a small bronze clam-shell device, self-tripping when it reached the bottom, for the purpose of bringing up samples of the ocean-bed. The weights of this outfit were as follows; each thousand fathoms of wire 12.42 pounds, each wooden reel 18 pounds, each lead 14 pounds. A complete thousand fathoms outfit weighed 44.42 pounds. The two outfits therefore, weighed 89 pounds, and a third extra lead brought this toral up to 103 pounds. When there was a "lead" they sounded from the edge of it, when there was no open water they made a hole in the ice when any could be found thin enough for the purpose. By reason of the lightness of the equipment, two men could readily make these deep-sea soundings.

Arms, etc.—A good rifle with sufficient ammunition, and a long, powerful telescope completed the field and hunting equipment.

Clothes.—In the winter they wore the regular Eskimo garments, modified to taste, consisting of a fur jacket made of fox or deer-skin, with no buttons, which goes over the head, called a Koolitang. Attached to this jacket is a hood and around the face a thick roll of fox-tails. The shirt or ahteah; is usually of fawn-skin with the hair inside next the skin of the wearer. Their fur trousers were made of the shaggy skin of the polar bear, hair outside; sometimes these trousers are made of caribou skin. with the fur inside; kaminks, or boots of sealskin soled with the heavier skin of the Big or Square-flipper seal (oogjook) and fur mittens of fawn skin completed the winter garb. In summer they wore woollen shirts, socks and trousers with jackets made of Michigan sheepskin.

The voyage.—The Roosevelt passed Cape York on August 1st 1908, the headland being encircled by a large number of floating icebergs which made it difficult for the ship to approach the shore.

Here some Eskimos came off in their kayaks. Their next stop was on August the 3rd, at North Star Bay, called by the Eskimos, Oomunnui, on Wolstenholme Sound, where they met the Erik and took on board several families of Eskimos. On August 5th a clear, sunshiny night, Peary transferred to the Erik and visited the various Eskimo settlements on Inglefield Gulf and along the coast, while the Roosevelt steamed ahead to Etah. Peary visited Karnah on the Redcliffe Peninsula, then Kangerdlooksoah near the head of the gulf; then south to the Itiblu Glacier and north again to Kookan in Robertson bay, then to Nerke, on Cape Saumarez and then on to Etah, where he joined the Roosevelt having gathered in a number of Eskimos and their families and 246 dogs. He reached Etah on August 11th. Some three hundred tons of coal, and fifty tons of walrus and whale meat were transferred at Etah from the Erik to the Roosevelt; and fifty tons of coal were cached at Etah for the Roosevelt's return voyage the following year. Two men with full provisions for two years were left in charge and Mr. Harry Whitney, who had come in the Erik, for the purpose of hunting musk-ox and polar bear, was also landed at Etah. Rudolph Franke, who had came with Dr. Cook in 1907 returned in the Erik. Some more Eskimos were taken on board at Etah, 22 men, 17 women and 10 children, and 246 dogs. In addition the Roosevelt had on board 70 tons of whale meat, bought in Labrador and the meat and blubber of 50 walruses. When she left Etah there were sixty-nine persons on board.

Etah to Cape Sheridan.—The Roosevelt left Etah on the afternoon of August 18th, and shortly after having struck a small iceberg in the fog, which fortunately did no dammage. From there on she had to force her way through the most dangerous ice-passage in the world, until she reached Cape Sheridan, her destination and wintering place, 350 miles north of Etah. "From Etah to Cape Sheridan."—Imagine about 350 miles of almost solid ice of all shapes and sizes, mountainous ice, flat ice, ragged and tortured ice, ice that for every foot of height revealed above the surface of water, hides seven feet below.

Character of ice encountered.—Peary in his "North Pole" gives the following lurid description of the ice, met with in Kennedy and Robeson channels:—"It must be remembered that from Etah to Cape Sheridan, for the greater part of the course, the shores on either side are clearly visible,—on the east the Greenland coast, on the west the coast of Ellesmere Land and Grant Land. At Cape Beechey, the narrowest and most dangerous part, the channel is only eleven miles wide, and when the air is clear it almost seems as if a rifle bullet might be fired from one side to the other. These waters, save in exceptional seasons, are filled with the heaviest kind of ice, which is constantly floating southward from the Polar Sea towards the Baffin bay.

"Whether this channel was carved in the solid land by the force of pre-Adamite glaciers, or whether it is a Titanic cleft formed by the breaking off of Greenland from Grant Land, is a question still undetermined by geologists; but for difficulty and danger there is no place to compare with it in the whole arctic region.

"It is hard for a layman to understand the character of the ice through which the Roosevelt fought her way. Most persons imagine that the ice of the Arctic regions has been formed by direct freezing of the sea water; but in summer time very little of the floating ice is of that character. It is composed of huge sheets broken off from the glacial fringe of North Grant Land broken up by constant contact with other floes and with the land, and driven south under the impetus of the violent flood tides. It is not unusual to see these ice between 80 and 100 feet thick. As seven-eight's of these heavy floes are under water, one does not realize how thick they are until one sees where a huge mass, by the pressure of the pack behind it, has been driven upon the shore, and stands there high and dry, eighty or a hundred feet above the water, like a silver castle guarding the shore of this exaggerated and ice-clogged Rhein.

"The navigation of the narrow and ice-encumbered channels between Etah and Cape Sheridan was long considered an utter impossibility and only four ships besides the Rosevelt have succeeded in accomplishing any considerable portion of it. Of these four ships, one, the Polaris, was lost. Three the Alert the Discovery, and the Proters, made the voyage up and back in safety; but one of these the Proters was lost in an atttempt to repeat the dash. The Roosevelt on the expedition of 1905-6 made the voyage up and back, though she was badly smashed on the return.

"Going north, the Roosevelt followed the coast a portion of the way, as only close to the shore could any water be found which would enable the ship to advance. With the shore-ice on one side, and the moving central pack on the other, the changing tides were almost to give us an occasional opportunity to steam ahead.

"This channel is the meeting place between the tides coming from Baffin bay on the south and Lincoln sea on the north, the actual point of meeting being about Cape Frazer. South of that point the flood tide runs north, and north of it the flood tide runs south. One may judge of the force of these tides from the fact that on the shores of the Polar sea the mean rise is only a little over a foot, while in the narrowest part of the channel the tides rise and fall 12 or fourteen feet.

"As a rule looking across the channel, there seems to be no water—nothing but uneven and tortured ice. When the tide is at the ebb, the ship follows the narrow crack of water between the shore and the moving pack of the centre, driving ahead with all her force; then when the flood tide begins to rush violently southward, the ship must hurry to shelter in some niche of the shore ice, or behind some point of rock to save herself from destruction or being driven south again.

"This method of navigation, however is one of constant hazard, as it keeps the vessel between the immoveavle rocks and the heavy and rapidly drifting ice, with the ever present possibility of being crushed between the two. On my various expeditions I had walked every foot of the coastline, from Payer Harbour on the south to Cape Joseph Henry on the north, from three to eight times. I knew every indentation of that coast, every possible shelter for a ship, every place where icebergs usually grounded, and the places where the tide ran strongest, as accurately as a tugboat captain in New York harbour knows the piers of the North River water front. When Bartlett was in doubt as to making a risky run, with the chance of no shelter for the ship I could usually say to him: "At such and such a place, so far from here, is a little niche behind the delta of a stream, where we can drive the Roosevelt in, if necessary; or Here icebergs are almost invariably grounded, and we can find shelter behind them: "or" Here is a place absolutely to be shunned, for the floes pile up here at the slighest provocation, in a way that would destroy any ship afloat". It was this detailed knowledge of every foot of the Ellesmere Land and Grant Land coasts, combined with Bartlett's energy and ice experience that enabled us to pass four times between this arctic Scylla and Charybdis.

Cape Sabine.—Cape Sabine and Payer Harbour, where Peary wintered in 1901-2 were passed the first night out from Etah. North of Cape Sabine there was so much open water that they thought of hoisting the lug sail to run before the southerly wind, but changed their minds when they saw the appearance of the ice. About 60 miles north of Etah they ran into a solid ice-pack, where they filled their water-tanks with fresh water ice from a flœ.

They drifted slowly north with the south wind and as the strong wind opened pools of water in the ice they steamed westward toward the Land, with the spray blowing clear across the deck. The boats were provisioned and hoisted ready in case the Roosevelt should be crushed or sunk by the ice; and every body was ready with a small bundle to climb over the side and provisions were placed near the rail, to be thrown on the ice in case of need. It rained heavily with the south wind and as the wind opened up leads in the ice, they slowly pushed and bored their way northwayd through the ice, which would have been impassable for any ordinary ship. Dense fog descended from time to time and added to the dangers of the situation. The engines of the Roosevelt were equipped with a by-pass, by which live steam could be turned into the big cylinder, thus more than doubling the power of the engines for a few minutes. This simple bit of mechanism saved her on several occasions from being caught and crushed between the heavy ice-flœs. On the 22nd of August, the fifth day they had a phenomenal run and made over a hundred miles right up the middle of Kennedy Channel, uninterrupted by ice or fog and at midnight the sun shone bright through the clouds. On that day they had run the entire lenght of Kennedy Channel and saw only scattered ice ahead. But beyond, thirty miles away, lay Robeson channel where they encountered again ice and fog. While looking for an opening the ship was forced clear across to the Greenland coast at Thank God Harbour, the winter quarter's of Hall's ship, the Polaris, in 1871-72. From here on they were biting the drifting flœs dodging through lanes of open water or taking shelter behind the grounded bergs and in small bay. The weather was alternately foggy, cloudy and, sometimes sunny. There was no darkness as it was the season of perpetual day and night. Sometimes when the ship was beset, the men of the party would leave the ship and travel over the loose ice pans to the shore, to get a glimpse of the condition of the ice ahead of them. On these occasions, using the boat hooks as vaulting poles they would leap from one flœ to another, when the leads were not too wide At other times, when the open water could not be crossed in that fashion, they would cross the leads on small floating cakes of ice, using their hooks to push and pull themselves along and sometimes, slipping at the edge of a flœ, would fall waist-deep into the icy water being rescued by their companions. It requires a good nerve, strong legs and steady eye to travel over the treacherous, grinding Arctic pans. On August 24th the Roosevelt lay quietly all night in open water and on August 25th steamed northward nearly to Cape Union, but finding the ice closely packed beyond that place, returned to Lincoln Bay where the ship was made fast between two grounded ice-flœs. It snowed heavily all that day. A cache of provisions was piled on the shore, as a precaution in case any mishap should befall the ship. They lay in Lincoln Bay all the next day, protected by the grounded flœs outside them from the endless procession of ice-flœs that were being hurled through the narrow straits by a strong, raw, north-east wind. The next day was spent in creeping up the narrow lane of open water that was opened up along the shore by the force of the wind and in dodging icebergs and flœs that whirled about them before the strong tide. There was no sleep on that night. August 30th was the most trying day of the trip, as a large flœ picked up the grounded berg to which they were moored and dashed the berg against the ship, smashing a big hole in the bulwarks, and another berg split in two just ahead of them, one huge piece missing the ship as it fell by a few feet only and the ship, quite at the mercy of the ice, was driven towards the shore. At this point dynamite was placed between cracks in the ice-flœ that threatened the ship and the ship was relieved from the ice-pressure, but she had been pushed too close to the shore, and as the tide lowered was bodily aground from amidships forward, heeling over on one side and then the other with the pressure of the ice. A little before midnight on September 2rd, the Roosevelt escaped from the impasse in which she had been imprisoned at Lincoln Bay for the past ten days and steaming first forward and then astern, extricated herself from the shore ice. Following a narrow lane of open water along the shore she rounded Cape Union about half an hour after midnight.

Black Cape.—"But we soon were held up again by the ice, a little below Black Cape, a dark cone-shaped mountain standing alone, on the eastern side washed by the waters of the sea, on the west separated by deep valleys from the adjacent mountains. It was a scene of indescribable grandeur, for the coast was lined for miles with bergs, forced shoreward, broken and tilted at right angles. At Black Cape we had made half the distance between our former position at Lincoln Bay and then longed—for shelter at Cape Sheridan."

At Black Cape they made the ship fast to the land ice, and the Eskimos were set to work with axes bevelling of the ice-foot abreast of the ship, to enable her to rise easily should she be squeezed by the heavy flœs outside. Here another cache of provisions was landed in case of emergency. On September 4th, the wind came strong from the south and seeing a little open water ahead they started to leave their berth. It took an hour to break up the "slob" ice which had cemented about the ship. But the ice ahead refused to open and drift ice coming rapidly up from the south before the wind, they were compelled to hurry back to Black Cape. They had trouble in regaining this position and coming in contact with a large berg, the starboard quarter boat was badly smashed and the starboard corner of the forward deck house was almost ripped from the decking. That evening the ebb tide slackened the ice and they reached the delta of Black Cape river, a few miles north of their former shelter; but when the tide turned were obliged to hurry back a short distance to the shelter of a grounded berg. To the north was a solid sea of packed ice. The wind continued to blow violently from the south and early in the morning of September 5th the ice began to slack a little, and orders were given to steam full speed ahead. They rounded Cape Rawson when the sloping headland of Cape Sheridan, Lat. 82° 30′, the long looked-for haven, came into view. They rounded the cape at a quarter past seven in the morning, fifteen minutes later than the time of their arrival at the same spot in 1905. Seeing open water ahead, they steamed on hoping to reach Porter bay, but after two miles coming upon an impenetrable barrier of ice, they steamed back to Cape Sheridan where they decided to make their headquarters. The Roosevelt was grounded inside the ice-crack. Stores and other heavy materials such as whale and walrus meat coal and boats were landed on the shore ice to make the ship lighter. A gang of men were set to work with ice-chisels, poles, saws and axes to chop away the ice so that the Roosevelt could be warped, at high tide, broadside to the shore, so as to get the ship beyond the flœberg barrier and into the shallow water of the ice-foot. On the previous expedition the ship, being moored just on the edge of the ice-foot, was subjected to every movement of the icepack, with the constant danger of being crushed or carried away. All the stores were landed at once so, in case of the ship being destroyed by fire or crushing of the ice, they would not suffer for want of food shelter. Eighty tons of coal were also landed to act as fuel in case of the loss of the ship. This was the first part of the daring programme successfully accomplished.

The Fall Months.—The autumn months were spent in hunting musk-ox, caribou, polar bear, in the vicinity of Porter Bay, James Ross Bay with its towering mountains, Clements Markham's Bay and Hazen Lake. Provisions for the attack on the pole next spring were conveyed by sledges along the shore from the ship to Crane City, Cape Columbia, ninety miles north-west of Cape Sheridan, from where the march over the ice-crust of the Polar ocean begin. This was done by a system of relay stations at Cape Belknap, Cape Richardson, Porter Bay, Sail Harbour, Cape Colan and finally at Cape Columbia. By this means the trail was kept open and the sledge parties had time to hunt at the same time. MacMillan suffered an attack of grip in September due to the raising of temperatures by the south wind. Peary relates on page 176 of "The North Pole" how, following one of the peculiar Greenland storms, similar to those in the Alps—a storm which evidently swept the entire width of Greenland from the south-east, raising the temperature from the minus thirties to plus forty-one in 24 hours in 1892—every member of his party, and even some of the Eskimos, had a pronounced attack of grip. This fall work was valuable training for the new men who were unaccustomed to the regions of the [1]Arctic climate. It taught them how to defend themselves against frostbite, how to get the most benefit and protection from their clothes and how to handle the dogs and the Eskimos.

As early as November they began to be worried about the dogs as many of them had died and all were in poor condition. On the 8th of November there remained only 192 out of the original 246, and the whale meat seemed to be lacking in nutriment; so they tried to feed them on pork. Sixteen more died and by November 25th there were only 160 left and ten of them were in such bad condition that they began to fear that they would soon not have enough left for the spring march to the Pole. They eventually found that walrus meat, of which they had an abundance, was the best food. Peary writes on this question of dogs: "It is always necessary to take up twice as many dogs as will be needed, in order to provide for probable accidents. It is absolutely impossible to figure on the Eskimo dog's uncertain tenure of life. The creatures will endure the severest hardships; they will travel and draw heavy loads on practically nothing to eat, they will live for days exposed to the wildest arctic blizzard; and then, sometimes in good weather after an ordinary meal of apparently the best food, they will lie down and die. Dogs, and plenty of them, were vitally necessary to the success of the expedition. Had an epidemic deprived us of these animals, all the money brains and labour would have been utterly thrown away, so far as concerned the quest of the North Pole."

Water Supply.—They got their water from a pond one mile inland from the Roosevelt, with fifteen feet of water in it, when the water of the Cape Sheridan river failed them. They built a snow igloo over the ice-hole to keep the water in the hole from freezing quickly and brought the water in barrels on sledges drawn by the Eskimo dogs. On Christmas day the thermometer was only 23° below zero. On October 29th., it was 26° below zero. On October 12th the sun disappeared below the southern horizon and did not reappear again until February 9th one hundred and ten days of darkness and intense cold in the midst of ice, snow, furious storms and the bleakest desolation. A record of the approximate mean temperatures for the winter showed that every month except October had been colder than three years before. For December it was eight degrees lower.

By the February moon more stores were moved up to Cape Columbia and other sledge parties in divisions, followed.

Peary's Plan.—Peary's plan which he worked out and adhered to with remarkable success and good fortune, was to drive the ship through the ice to the farthest possible land base from which she could return the following year Cape Sheridan; to do enough hunting during the fall and winter to keep the party supplied with fresh meat; to have dogs enough to allow for the loss of 60% by death or otherwise; to employ the Eskimos as sledge drivers and helpers; to transport beforehand to the point (Cape Columbia) where the expedition leaves the land for the sledge journey, sufficient food, fuel, clothing, stoves (oil or alcohol) and other mechanical equipment to get the main party to the Pole and back and the various divisions to their farthest north and back; to have an ample supply of the best kind of sledges; to have a sufficient number of divisions, or relay parties, each under the leadership of a competent assistant, to send back at appropriate and carefully calculated stages along the upward journey to the Pole; to have every item of equipment of the best quality, thoroughly tested, and of the lightest possible weight; to know by long experience, the best way to cross wide leads of open water; to take along only men, Eskimos included, who were absolutely efficient and thoroughly to be relied on; and to return by the same route followed on the upward march, using the beaten trail and the already constructed igloos to save the time and strength that would have been expended in constructing new igloos and in trail-breaking.

The Sledge parties.—Bartlett's division, consisting of himself, 3 Eskimos, with one sledge and team of dogs, carrying their own gear and five dogs supplies, was to pioneer the road and act as trail-breaker, keeping close to the main party, one day ahead. Next came Borup's division with himself, 3 Eskimos, four sledges and dog teams acting as a supporting party to Bartlett for three marches and then hurry back to Cape Columbia in one march and bringing up more supplies. Bartlett's pioneer party was to make a march in every 24 hours in spite of every obstacle except on impossible lead, and no matter what the weather might be. He had only lightly loaded sleds, the best dogs and five or six days provisions and was replenished by overtaking supporting parties that kept travelling between him and Cape Columbia. The supporting parties by thus constantly travelling to and from between the pioneer party and the land base were able to keep the trail open for the main party when it returned from the Pole, and to knit together the breaks in the trail caused by the crushing grinding and drifting of the floes and the opening of leads or water channels across the trail and subsequently freezing over again with newly formed ice.

Each sled party self dependant.—The other supporting divisions were headed by Marvin, Mac Millan, Dr Goodsell and Hensen, each with 2 Eskimos, 3 sleds and dog teams. Each division was self dependant and had its complete travelling outfit; in fact, except for the alcohol stove and cooking utensils, each sledge was complete in itself. On each sledge were the provisions for men and dogs, and clothing for the drivers. The standard sledge load would support the driver and the dog team for about fifty days, and by sacrificing a few dogs as food for the other dogs and the men, for sixty days. Were any sledge and its provisions cut off from the rest of its division, the man with it would have had every thing he needed, except the cooking outfit. Had the sledge with the alcohol stove been lost, either in a lead or otherwise, the division to which it belonged would have had to double up with one of the other divisions. It would seem as if two stoves to a division instead of one, would have been a wiser prevision.

The main party.—The main party that was destined to reach the Pole consisted of Peary, Henson and four Eskimos, Oo-queah, Ootah, Egingwah and Seegloo, consisting of two divisions, headed by Peary and Henson, that amalgamated when within striking distance of the Pole.

Keeping sled parties in constant touch.—The main preocupation throughout the trip over the polar ice was to keep the pioneer division always supplied and steadily moving ahead with the supporting divisions keeping close and in constant touch with both the main and pioneer parties and to have them all massed as close together to minimise as much as possible their being separated and the trail broken by the opening of water channels in the ice.

Peary leaves the ship.—When Peary left the ship in February 22. 1909 for Cape Columbia there were already in the field ahead of of him, seven members of the expedition, nineteen Eskimos, one hundred and forty dogs, and 28 sledges in six advance divisions which were to meet him at Cape Columbia on the last day of February. The trail from the ship to Cape Columbia was ninety miles long with Cape Hecla half-way, and had been kept open by the hunting parties and supply trains. The trail followed the ice-foot along the coast the greater part of the way, only taking to the land occasionally to cut across a peninsula and thus shorten the road.

Bartlett starts for the Pole.—On the last day of February Bartlett and Borup started away to the north over the glacial fringe from the land with their divisions, as there was by that time enough daylight to travel by and they were thus the first to embark on the Polar ocean.

Before starting two Eskimos were disabled through frozen heels and had to be left at Cape Columbia and six more dogs died of throat distemper. This caused the abandonment of the idea of a pick-axe division under Goodsell, just ahead of the main party.

Peary leaves Cape Columbia for the Pole.—On March 1st., all the supporting parties drew away from Cape Columbia and followed Bartlett's trail over the glacial fringe round the shore and then on to the ice towards the Pole. Peary's main party brought up the rear and an hour after starting he had crossed the narrow glacial fringe and embarked on the Polar ocean about latitude 83º with a Polar party comprising altogether 24 men, nineteen sledges and 133 dogs. For the first time in all his many years of experience the wind was blowing strong from the east.

They started from Cape Columbia the most northerly point on the north coast of Grant Land across the sea-ice eight days earlier than their start from Cape Hecla three years before in 1906.

Ice Navigation.—From Cape Columbia their course lay 413 geographical miles straight north over the ice of the Polar sea. The distance travelled day by day was first determined by dead reckoning and verified later by sun observations for latitude. Dead reckoning was the compass course for direction, and for distance the mean estimate of the various division leaders as to the length of each day's march. On board ship dead reckoning is the compass course for direction and the reading of the log for distance. On the smooth inland ice of Greenland, Peary made his dead rekoning from the compass course for direction and from the odometer, a wheel with a cyclometric registering apparatus, for distance. The odometer could not be used on the rough ice of the polar sea, as it would have been smashed into pieces when the sleds overturned. In general the dead reckoning on the polar ice was the personal estimate of approximate distance, checked and corrected from time to time by astronomical observations. During the earlier stages of the journey there was no sun by which to take observations. As soon as the sun rose high enough above the horizon, observations were taken every five marches.

The Polar Ocean.—Peary gives the following description of the Polar Ocean: "There is no land between Cape Columbia and the North Pole and no smooth and very little level ice.

Glacial Fringe.—For a few miles only after leaving the land we had level going, as for those few miles we were on the "glacial fringe". This fringe which fills all the bays and extends across the whole width of North Grant Land, is really an exagerated ice-foot; in some places it is miles in width. While the outer edge in places is afloat and rises and falls with the movements of the tides, it never moves as a body, except where great fields of ice break off from it and float away upon the waters of the Arctic Ocean.

Tidal Crack.—"Beyond the glacial fringe is the indescribable surface of the shore lead, or tidal-crack-that zone of unceasing conflit between the heavy floating ice and the stationary glacial fringe. This shore lead is constantly opening and shutting; opening when there are off shore winds, or spring ebb-tides, crushing shut when there are northerly winds or spring flood tides. Here the ice is smashed into fragments of all sizes and piled up into great pressure ridges parallel with the shore.

Pressure Ridges.—"The ice is smashed into these pressure ridges by the sheer and unimaginable force with which the floes are driven against the edge of the glacial fringe, just as farther out the pressure ridges are caused by the force with which the great floes themselves are crushed and smashed together by the force of the wind and the tides.

"These pressure ridges may be everywhere from a few feet to a few rods in height; they may be anywhere from a few rods to a quarter of a mile in width; the individual masses of ice of which they are composed may vary, respectively, from the size of a billiard ball to the size of a small house.

"Going over these pressure ridges one must pick his trail as best he can, after hacking his way with pick-axes, encouraging the dogs by whip and voice to follow the leader, lifting the 500 pound loaded sledges over hummocks and up acclivities whose difficulties sometimes seem likely to tear the muscles from one's shoulder-blades.

Old floes.—Between the pressure ridges are the old floes, more or less level. These floes contrary to wide-spread and erroneous ideas, are not formed by direct freezing of the-waters of the Arctic Ocean. They are made up of great sheets of ice broken off from the glacial fringe of Grant Land and Greenland, and regions to the westward, which have drifted out into the polar sea. These fields of ice are anywhere from less than twenty to more than one hundred feet in thickness, and they are of all shapes and sizes.

Surface of Polar Sea.—"As a result of the constant movement of the ice during the brief summer, when great fields are detached from the glaciers and are driven hither and thither under the impulse of the wind and the tides-unpinging against one another, splitting in two from the violence of contact with other large fields crushing up the thinner ice between them, having their edges shattered and piled up into pressure ridges the surface of the polar sea during the winter may be one of almost unavigable unevenness and roughness.

"At least nine-tenths of the surface of the polar sea between Cape Columbia and the Pole is made up of these floes. The other one-tenth, the ice between the floes, is formed by the direct freezing of the sea water each autumn and winter. This ice never exceeds eight or ten feet in thickness".

Ice conditions dependant on weather.—"The weather conditions of the fall determine to a great extent the character of the ice surface of the polar sea during the following winter. If there have been continuous shoreward winds at the time when the increasing cold was gradually cementing the ice-masses together, then the heavier ice will have been forced toward the shore; and the edges of the ice-fields farther out, when they come in contact, will have piled up into a series of pressure ridges one beyond the other, which any one travelling northward from the land must go over, as one would over a series of hills.

"If, on the other hand, there has been little wind in the fall, when the surface of the polar sea was becoming cemented and frozen over, many of these great floes will have been separated from other floes of like size and character, and these may be stretches of comparatively smooth young or new ice between them. If, after the winter has set in, there should still be violent winds, much of this thinner ice may be crushed up by the movement of the heavier floes; but if the winter remains calm, this smoother ice may continue until the general breaking up in the following summer.

Leads.—But the pressure ridges above described are not the worst feature of the arctic ice. Far móre troublesome and dangerous are the "leads" (the whaler's term for lanes of open water) which are caused by the movements of ice under the pressure of the wind and tides. These are the even-present nightmare of the traveller over the frozen surface of the polar ocean on the upward journey for fear that they may prevent further advance; on the return journey for fear that they may cut him off from the land and life, leaving him to wander about and starve to death on the northern side. Their occurrence or non-occurence is a thing impossible to prophesy or calculate. They open without warning immediately ahead of a traveller, following no apparent rule or law of action. They are the unknown quantity of the Polar equation.

Method of crossing leads.—"There are various ways of crossing the leads. One can go to the right or the left, with the idea of finding some place where the opposite edges of the ice are near enough together so that our long sledges can be bridged across. Or, if there are indications that the lead is closing, the traveller can wait until the ice comes quite together. If it is very cold, one may wait until the ice has formed thick enough to bear the loaded sledges going at full speed. As, one may search for a cake of ice, or hack out a cake with pick-axes, which can be used as a ferry-boat on which to transport sledges and teams across.

The "Big Leads".—But all these means go far naught when the "big lead", which marks the edge of the continental shelf where it dips down into the Arctic Ocean, is in one of its tantrums, opening just wide enough to keep a continued zone of open water or impraticable young ice in the centre, as occured on our upward journey of 1906 and the never-to-be forgotten return journey of that expedition, when this lead nearly cut us off forever from life itself. The "big lead" probably follows the continental shelf at about the 84th., parallel. The continental shelf is simply a submerged plateau surrounding all the continent, the "big lead" marking the northern edge of that shelf when it dips into the polar sea.

A big lead.—Describing one of the big leads, Peary writes: "A broad and ominous band of black extending far to the east and west across our course and apparently ten or fifteen miles to the north of us, gave me serious concern. Evidently the ice was all abroad in every direction, and the high temperature and snow accompanying the west wind proved that there was a large amount of open water in that direction. Pushing on, we soon reached the Captain's camp. There I found the familiar unwelcome sight which I had so often before me on the expedition of 1905-06 the white expanse of ice cut by a river of inky black water, throwing off dense clouds of vapour which gathered in a sullen canopy overhead, at times swinging lower with the wind and obscuring the opposite shore of this malevolent Styx. The lead had opened directly through the heavy floes, and, considering that floes are sometimes 100 feet in thickness, and of almost unimaginable weight, the force that could open such a river through them is comparable with the forces that threw up the mountains on the continents and opened the channels between the lands". They were held up for five days March 5th to 10th by this lead on the way northward.

"Should the ice open across the bed platform of any igloo, and precipitates its inhabitants into the icy water below, they would not readily drown, because of the buoyancy of the air inside their fur clothing. A man dropping into the water in this way might be able to scramble onto the ice and save himself; but with thermometer at 50° below zero it would not be a pleasant contigency."

Young ice.—Another danger to be faced is the young, or new ice that forms in a night over the open leads between the flœs. Peary encountered one of these on April 4th. "Near the end of the day we crossed a lead about 100 yards wide on young ice so thin that, as I ran ahead to guide the dogs, I was obliged to slide my feet and travel wide, bear style, in order to distribute my weight, while the men let the sledges and dogs came over by themselves, gliding across where they could. The last two men came over on all fours. I watched them from the other side with my heart in my mouth—watched the ice bending under the weight of the sledges and the man. As one of the sledges neared the north side, a runner cut clear through the ice, and I expected every moment that the whole thing, dogs and all, would go through the ice and down the bottom.

"This dash reminded me of that day, nearly three years before when in order to save our lives we had taken desperate chances in recrossing the "Big Lead" on ice similar to this—ice that buckled under us and through which my tœ cut several times as I slid my snowshœs over it. A man who should wait for the ice to be really safe would stand small chance of getting far these latitudes. Travelling on the polar ice, one takes all kinds of chances. Often a man has the choice between the possibility of drowning by going on or starving to death by standing still, and challenges fate with the brief and less painful chance.

Marvin's death.—Roes G. Marvin, one of the Peary's assistants, when returning to the land lost his life on April 10th, when, some distance ahead of the sledges, he broke through the treacherous young ice that had but recently closed over a streak of open water at the "Big Lead". He apparently did not notice the gradual thinning of the ice towards the centre of the lead until it was too late and he was in the water. The Eskimos were too far in the rear to hear his calls for help, and death must have come quickly in that ice-cold water. One of the Eskimos on arriving at the spot where the ice was broken said that the back of Marvin's fur jacket was still visible at the top of the ice, but it was impossible for them to recover the body.

Polar difficulties.—"The difficulties and hardships of a journey to the North Pole "writes Peary," are too complex to be summed up in a paragraph. But, briefly stated, the worst of them are: the ragged and mountainous ice over which the traveller must journey with his heavily loaded sledges; the often terrific wind, having the impact of a wall of water, which he must march against at times; the open leads already described, which he must cross and recross, somehow; the intense cold sometimes as low as 60° below zero, through which—he must—by fur clothing and constant activity—keep his flesh from freezing; the difficulty of dragging out and back over the ragged and "lead" interrupted trail enough pemmican, biscuit, tea, condensed milk, and liquid fuel to keep sufficient strength in his body for travelling. It was so cold much of the time in this last journey that the brandy was frozen solid, the petroleum was white and viscid, and the dogs could hardly be seen for the steam of their breath. The minor discomfort of building every night our narrow and unconfortable snow houses, and the cold bed-platform of that igloo on which we must snatch such hours of rest as the exigencies of our desperate enterprise permitted us, seem hardly worth mentioning in comparison with the difficulties of the main proposition itself.

Blizzards.—"At times one may be obliged to march all day long facing a blinding snowstorm with the bitter wind searching every opening in the clothing. Those among my readers who have ever been obliged to walk for even an hour against a blizzard, with the temperature ten or twenty degrees above zero, probably have keen memories of the experience. Probably they also remember how welcome was the warm fireside of home at the end of their journey. But let them imagine tramping through such a storm all day long, over jagged and uneven ice, with the temperature between fifteen and thirty degrees *below* zero, and no shelter to look forward to at the end of the day's march excepting a narrow and cold snow house which they would themselves be obliged to build in that very storm before they could eat or rest.

"But fortitude and endurance alone are not enough in themselves to carry a man to the North Pole. Only with years of experience in travelling in these regions, only with the aid of a large party, also experienced in that character of work, only with the knowledge of arctic detail and the equipment necessary to prepare himself and his party for any and every emergency, is it possible for a man to reach that long sought goal and return."

March to the Pole

Peary's.—Peary and his divisions, comprising altogether 24 men, nineteen sledges, and 133 dogs, left Cape Columbia, latitude 83° N., longitude 71° W., at ten oclock in the morning of March 1st., 1909.

After passing the glacial fringe and the pressure ridges several miles in width of the tidal crack, they struck the old floes, which were covered with only a few inches of snow, hard-packed by the wind, when the going was better. On March 4th they struck the first lead of open water, and came to the "big lead" already described, in Lat. 84°, the next day where they were detained five days. The temperature ranged from 5° to 32° below zero. This march to the edge of the lead put them beyond the British record of 83° 20' made by Captain Clements Markham, north of Cape Joseph Henry, on May 12, 1876. On March 10th, the lead being nearly closed they crossed the big lead and parallel 84° and advanced twelve miles. That night the ice kept up a continual grinding, groaning and creaking, as the heavy pieces of ice were crunched together by the movement of the tide.

On March 11th, the temperature was 45° below zero, and on March 13th, the thermometer ranged from 53° and 59° below zero. As there was bright sunshine at midday, and no wind, they did not suffer in their fur clothing from the cold. The brandy was frozen solid, the petroleum was white and viscid, and the dogs, as they travelled, were enveloped in a white cloud of their own breath. On March 14th, Dr Goodsells' division turned back for the ship at Lat. 84° 29′. Marvin made a sounding through the ice at this point and got 825 fathoms which showed that the "Big lead" on the edge of the continental shelf had been crossed. March 15th., which was clear and cold, with a temperature of 45° and 50° below zero, MacMillan with his division set out for the ship. The wind had shifted again to the East and was very penetrating. They had several leads to cross. On March 17th., they marched over a broad zone of very rough rubble ice, with a good deal of young ice between. From the time of MacMillan's departure at the end of every five marches supporting a division turned back for the ship. On March 19th., the temperature was 50° below zero and the trail was very heavy and much raftered ice. That night they camped in latitude 85° 23' in the neighbourhood of the "storm camp" of Peary's 1906 expedition; but they were 23 days ahead of the former schedule. Here Borup's division returned to the land. From here on, each division consisted of three men instead of four, although being hungrier they consumed four mens' rations. On the 20th. Marvin made a sounding and got 310 fathoms. The going was partly over rough, heavy ice and partly across, large level flœs. On March 22nd. Marvin took an observation of the sun and found them to be in latitude 85° 48', figuring on the refraction of minus 10 Farh. the lowest temperature for which they had tables. Up to this point they had averaged eleven and and a half geographical miles of northward progress for each day. The next day, March 23rd., put them across the 86th parallel. They crossed several leads and travelled over small old flœs with heavy pressure ridges between, which they climbed over with much difficulty. They passed Nansen's "Farthest North" Norwegian record of 86° 13' 6" and fifteen days ahead. The next day, March 24th, they made a good march of 20 miles in a snow-storm, crossing several leads with treacherous young ice. Near these leads they saw the fresh tracks of a polar bear going west, towards Crocker land, and over 200 miles from land. On March 25th, Marvin took an observation in clear weather and obtain 86° 38′ which was beyond Cagnis' Italian record, of which they were 32 days ahead in time. They had averaged sixteen and two thirds miles per march for the last three days. On March 26th, Marvin turned back, with his division, latitude 86° 38′, and lost his life by falling through young ice in a lead and being drowned before he reached the land. Peary now had eight companions, sixty dogs and seven fully loaded sledges; and Bartlett kept breaking trail one day in advance. The trail lay over large, level snow-covered flœs, of varying height and surrounded by medium rough old rafters of ice and young ice averaging a foot thick. Near the end of the day they were deflected some distance to the west by an open lead. The temperature was fifteen to 20 below zero. On March 27th., they had a rough march over broken and raftered ice, sharp and jagged which cut their sealskin boots and was painful to the feet. The day was a brilliant dazzling sunshine, the sky a glittering blue and, although provided with smoked goggles, the dazzling glare of the ice pained their eyes. The temperarure was 30 to 40° below zero. During the day they saw the track of two foxes nearly 240 nautical miles beyond the northern coast of the Grant Land. They were now across the 87th parallel in the region of perpetual sunlight for about six months day and six months night during the rest of the year, and only six miles south of Peary's farthest north in 1906. On March 28th., they came on a wide lead of open water, after travelling over large flœs and young ice. In the night a broad lead opened up between Peary and Bartlett's igloos, and the latter floated away on an ice-raft. Both parties managed on to get to a large, old flœ where they camped in latitude 87° 12'. Bartlett made a sounding from the edge of the flœ and got, 1,260 fathoms but found no bottom. From the open lead black smoke belched out, as thick as a prairie fire and they could not see how far the lead extended to the north. On March 30th., the lead closed up before a bitter northwest breeze, with the temperature 30° below zero, and they rushed the sledges across the junction of the flœs. That day they had to cross a lake of young ice. six or seven miles across, that buckled under their weight, and making 20 miles they camped on a heavy old flœ. Their experience of open leads here made them anxious as to the nature of the return journey, but they pressed on. They had to face a strong northerly, wind the next day, March 31st, but there was no westerly or easterly drift of ice, and the northerly wind closed up the leads. On arriving at camp, April 1st, Bartlett took an observation and obtained 87° 46′ 49″. Here Bartlett turned back, and Peary, culling the best dogs, proceeded on his way to the Pole, accompanied by his negro assistant, Henson, and the four Eskimos, Ootah, Ooqueah and Egingwah and Seegloo. Ootah and Henson had accompanied Peary on his expedition of 1906. They had now five sledges and forty dogs, the pick of 140 that had left the ship. They were 133 nautical miles from the Pole. Peary's plan was to press on, with utmost speed, in five marches of 25 miles a day and then to take an observation. The ice was smoother and the northerly winds had closed the leads. They rested on April 1st repairing sledges, and, killing the poorest dogs of Bartlett's division, ate them boiled, and fed them to the dogs.

The final spurt.—Early in the morning of April 2rd., they started on their final spurt to the Pole. The weather was clear and sunlit, the wind had sunk to a gentle breeze and the temperature was 30° below zero. The flœs were large and old, hard and level, with patches of sapphire blue (the pools of the preceeding summer) while the pressure ridges surrounding them were stupendous, some of them 50 feet high, they were not hard to negotiate, either through some gap or up the gradual slope of a huge snow-drift. The surface of the ice, on the great cap of the world, was absolutely dead level with a straight line for the horizon, except where pressure ridges cast, dark shadows on the ice. Steering from ice pinacle to pinacle, after taking a compass direction, they covered thirty miles due north the first day, and were well across the 88th parallel. At the end of the day they ferried the sledges across an open lead on an ice-cake. On April 3rd the weather continued clear and calm, and they travelled fast over level old flœs, having been delayed at the start by Pick-axing their way over some heavy pressure ridges. They made 20 miles and could hear the ice grinding on all sides under the influence of the high tide caused by the approaching full moon; a disk of silver opposed in the sky to the sun's disk of gold. By the water clouds behind them. They could see that a wide lead was opening some miles distant to the south and south-east. Continuing their march westward on April 4th over ice as level as the glacial fringe from Cape Hecla to Cape Columbia, and harder, they reeled off 25 miles in ten hours, passing over, at one place, some very thin young ice over which they were obliged to scrambled on all fours. That night they had nearly reached the 89th parallel and the temperature was 40° below zero. Here they put the poorest dogs into one team and began to kill and feed them to the other dogs. They continued on the same day, after a short rest, and travelling over the same level ice against a bitterly cold east wind, temperature minus 35°, struck a lead running north and south, covered with young ice, which they followed for two hours and over which the dogs raced along at a great pace. The Eskimos complained greatly of the cold east wind and for the first time had their noses frost-bitten. "The air was keen and bitter as frozen steel". At the next camp it was six weeks since they had left the Roosevelt, and they killed some more dogs. On April 5th they had reached 89° 25', thirty-five miles from the Pole and the going was even better than before. There was hardly any snow on the hard, granular surface of the old flœs, and the sapphire blue lakes were larger than ever. The temperature had risen to minus 15–, which softened the ice, surface and lessened the friction of the sled-runners. In twelve hours of actual travelling time they had made thirty miles. The last march northward ended at ten o'clock on the forenoon of April 6th. An observation at the last camp, Camp Marris Jessup, showed latitude 89° 57', only three miles from the Pole.

The North Pole.—After a rest for a few hours, Peary accompanied by two Eskimos, took a light sledge carrying only the instruments, a tin of pemmican and one or two skins, and drawn by a double team of dogs, pushed on an estimated distance of ten miles. The sky cleared and he took a satisfactory series of observations at, what he called, Columbia meridian midnight. "These observations indicated that their position was then beyond the Pole". "East, west, and north had disappeared for us. Only one direction remained and that was south. Every breeze that could possibly blow upon us, no matter from what point of the horizon, must be a south wind. Where we were, one day and one night constituted a year, a hundred such days and nights constituted a century. Had we stood in that spot during the six months of the arctic winter night, we should have seen every star of the northern hemisphere circling the sky at the same distance from the horizon, with Polaris (the North Star) practically in the zenith."

Polar observation.—"All during our march back to camp the sun was swinging around in its ever moving circle. At six o'clock in the morning of April 7th., having again arrived at camp Jessup, I took another series of observations. These indicated our position as being four or five miles from the Pole, towards Behring strait. Therefore, with a double team of dogs and a light sledge. I travelled directly towards the sun an estimated distance of eight miles. Again I returned to the camp in time for a final and completely satisfactory series of observations on April 7th at noon, Columbia meridian time, These observations gave results essentially the same as those made at the same spot twenty-four hours before. I had now taken in all thirteen single or six and one half double latitudes of the sun, at two different stations, in three different directions, at four different times. All were under satisfactory conditions, except for the first single altitude on the 6th. The temperature during these observations had been from minus 11° Fahrenheit to minus 30° Fahrenheit, with clear sky and calm weather (except as already noted for the single observatiom on the sixth).

"In traversing the ice in these various directions as I had done, I had allowed approximately ten miles for possible errors in my observations,and at some moment during the marches and countermarches, I had passed over or very near the point where north and south, east and west blend into one".

Precisely speaking the North Pole is simply a mathematical point, and therefore, in accordance with the mathematical definition of a point, it has neither breadth, length, nor thickness.

Determination of Polar's position.—"If the question is asked, how closely can the Pole be determined the answer will be : That depends upon the character of the instrument used, the ability of the observer using them, and the number of observations taken. If there were land at the Pole and powerful instruments of great precision, such as are used in the world's great observatoires, were mounted there on suitable foundations and used by practised observer for repeated observations extending over years, then it would be possible to determine the position of the Pole with great precision,

"With ordinary field instruments, transit, theodolite, or sextant an extended series of observations by an expert observer should permit the determination of the Pole within entirely satisfying limits, but not with the same precision as by the first method. A single observation at sea with sextant and the natural horizon as usually taken by the master of a ship, is assumed under ordinary satisfactory conditions to give the observer's position within about a mile. In regard to the difficulties of taking observations in the Arctic regions, I have found a tendency in the part of experts, who, however, have not had practical experience in the arctic regions themselves, to over estimate and exagerate the difficulties and drawbacks of making these observations due to the cold. My personal experience has been that, to an experienced observer, dressed in fur and taking observations in calm weather, in temperatures not exceeding, say 40° below zero Fahrenheit, the difficulty of the work resulting from cold alone are not serious. The amount and character of errors due to the effect of cold upon the instruments might perhaps be a subject for discussion, and for distinct differences of opinion. My personal experience has been that my most serious trouble was with the eyes. To eyes which have been subjected to brilliant and unremitting daylight for days and weeks, and to the strain of continually setting a course with the compass, and travelling towards a fixed point in such light, the taking of a series of observations is usually a nightmare; and the strain of focussing, of getting precise contact of the sun's images, and of reading the vernier all in the blinding light of which only those who have taken observations in bright sunlight on an unbroken snow expause in the arctic regions can form any conception, usually leaves the eyes bloodshot and smarting for hours afterwards. The continued series of observations in the vicinity of the Pole, noted above, left with eyes that were, for two or three days, unless for anything requiring careful vision, and had it been necessary for me to set a course during the first two or three days of our return I should have found it extremely trying. Snow goggles as worn constantly by us during the march, while helping do not entirely relieve the eyes from strain and during a series of observations the eyes became extremely tired and at times uncertain.

Probable error.—Various authorities will give different estimates of the probable error in observations taken at the Pole. I am personally inclined to think that an allowance of five miles is an equitable one. No one, except those entirely ignorant of such matters, has imagined for a moment that I was able to determine with my instruments the precise position of the Pole, but after having determined its position approximately, then settling an arbitrary allowance for about ten miles for possible errors of the instruments and myself as observer, and then crossing and recrossing that ten mile area in various directions, no one except the most ignorant will have any doubt what, at some time, I passed close to the precise point, and had perhaps, actually passed over it."

Record.—Peary remained thirty hours at the Pole where he raised the American flag and deposite a glass bottle containing a strip of the flag and a record of his discovery in a space between the ice blocks of a pressure ridge.

Return from Pole.—They started back from the Pole on their return march to Cape Columbia about 4 o'clock in the afternoon of April 7th., from which they were separated by 413 nautical miles of ice-flœs and open leads.

A hurried anxious journey.—"From now on it was to be a case of "big travel", little sleep, and hustle every minute. My plan was to try to make double marches on the entire return journey; that is to say, to start out, cover one northward march, make tea and eat luncheon, then cover another march, then sleep a few hours, and push on again. As a matter of fact, we did not fall much short of accomplishing this program. To be accurate, day in and day out we covered five northward marches in three return marches. Every day we gained on the return lessened the chances of the trail being destroyed by high winds shifting the ice. There was one region just above the 87th., parallel, a region above 57 miles wide, which gave me a great deal of concern until we had passed it. Twelve hours of strong wind blowing out from any quarter excepting the north would have turned that region into an open sea. I breathed a sigh of relief when we left the 87th parallel behind". "The dogs were given double rations and the poorer ones eliminated. Occasional storms and open leads were encountered, but they were not delayed over two hours at any one of these. In the greater part of the time, the weather was calm with dazzling sunshine and the temperature ranged between 10° and 30° below zero. The northerly wind prevented the young ice from opening to the south of them and they had passed the danger zone, some fifty miles wide, near the 87th., parallel by April 13th. They passed the zone of the Big Lead in 84° without much trouble, fifty miles from the land, on April 21st., where they saw numerous fresh tracks of bear, fox and hare. They reached the glacial fringe of Grant Land the next day and Cape Columbia early in the morning of April 23rd, where they rested two days, and then returned to the ship at Cape Sheridan in two marches.

Summary.—Peary's journey to the Pole from Cape Columbia had taken 37 days that included 27 marches. He returned in only sixteen days, an average of 26 miles a day; which was accounted for by the good condition of the ice, absence of big leads and the favourable wind and weather. The entire journey from Cape Columbia to the Pole and back occupied 53 days, or forty three marches.

Summer 1909.—On June 12th the summer had returned, the ice-floe turning blue and the ground gradually showing bare; on June 16th the first summer rain fell, although next morning all the pools were frozen. On June 22nd, the heat seemed almost tropical and glimpses of open water were seen round Cape Sheridan. On July the 8th the Roosevelt was moored in open water and started south on July 18th. Off Cape Union the ship bow was forced out into the ice in the centre of the channel, as being the quicker method when returning, than hugging the shore. On August the 8th the Roosevelt emerged from the ice at Cape Sabine, having made the downward trip from Cape Sheridan in 21 days as against 19 days when going north a distance of 350 miles. The Roosevelt had also reached the "farthest north" at Cape Sheridan 82o 30′ of any vessel under her own steam, although Nansen's ship the Fram when beset in the ice had drifted as far north as 85o 57′. They cleared Cape York on August 26th and entered India Harbour, Labrador on September 5th 1909 whence Peary telegraphed the news of his success.

Peary's records accepted.—On November 4th 1909, a sub-committee of the National Geographic Society specially appointed for that purpose reported that they had examined his original journal and record of observations, together with all his instruments and apparatus, and that they were unanimously of the opinion that Commander Peary had reached the Pole on April 6th 1909 and that "they also felt warranted in stating that the organization, planning and management of the expedition, its complete success, and its scientific results, reflect the greatest credit on the ability of Commander Robert E. Peary, and render him worthy of the highest honours that the National Geographic Society can bestow on him".

Gold medals.—A special gold medal was awarded to Peary in consequence; and he was also awarded gold medals, as the Discoverer of the North Pole, by the most of the Geographical Societies of the world, including Great Britain, Germany, Italy, Austria, Hungary, Belgium and Holland.

Scottish trophy.—Peary was presented with a special trophy by the Royal Scottish Geographical Society a replica in silver of the ships used by Hudson, Baffin and Davis. The ship is a copy of a three masted vessel in full sail, such as was in use in the latter part of the sixteenth century; and on one of the sails the following inscription in Latin was engraved: "This model of a ship, such as was used by John Davis, Henry and William Baffin, illustrious Arctic navigators of the olden time, has been presented by the Royal Scottish Geographical Society as an evidence of its congratulation, admiration and recognition to Robert Edwin Peary, American citizen, an explorer of the frozen Arctic, not less daring than his daring predecessors, who was the first to attain the thrice-noble goal so long sought by innumerable bold navigators the North Pole. Edinburgh, May 24th 1910."

Peary's book.—The foregoing is but a brief analysis of Peary's successful attack on the Pole, and to fully appreciate the magnitude of the task and the difficulties and dangers that encompassed it, the reader is referred to Commander Peary's own book, beautifully illustrated, entitled "The North Pole".

THE FUTURE OF THE ARCTICS

The question naturally arises, "What more in the future remains to be done in the Arctic?" The Pole has been definitely located in the depths of an impenetrable sea two miles deep; since the construction of the Suez and Panama canals and the development of steam for the propulsion of vessels there is no longer any need for a north-west passage; the whale fisheries are exhausted and the outlines of most of the Arctic islands have been explored and charted. The Arctic currents, tides, depths and prevailing winds have been recorded Life is almost impossible there, except under the most rigourous and often painful and repellant conditions. Transportation of goods in bulk, by sea or by land, is out of the question during the greater part of the year. Although rich in economic minerals, such as coal, iron, copper, petroleum, gypsum, building stones etc., mining is out of question on account of the inaccessibility, difficulties of transportation, absence of labour and excessive cost; and prospecting can only be accomplished under similar disabilities. Without the aid of a safe and practicable means of air locomotion the north offers no attractions to the sportman; as ships arrive too late in the summer to permit of reaching the hunting grounds for caribou, musk-ox and salmon by sledging over the ice; the sounds at that time are too full of ice for boating and at the same time sledging is impossible. In winter, the chase of the Polar bear, caribou, musk-ox and fox, during the intense cold, darkness, blizzards and fog, is not a pastime or an enjoyable sport, it is only indulged in when hunger and the direct necessity compel. The cost of arriving in the north, where everything for at least fifteen months has to be provided for ahead, is, to the ordinary traveller, prohibitive. The Eskimos are a few and far between and trapping for furs and pelts has to be done principally with their cooperation and through barter. For a vessel the voyage is always a hazardous one on account of icebergs, pack-ice, storms, fog and uncharted rocks and shores.

When aviation is further advanced the Arctic islands may possibly become, on account of the purity of the air, the grandeur of the scenery and great abundance of bird, fish and animal life, a favourite summer resort and recruiting ground in the months of June, July and August for wealthy sportsmen, tourists, artists and seekers after health and nerve tonic.

For explorers, geographers, governments and scientists generally there still remain to be traced, sounded, mapped and explored the undiscovered, but almost certainly existant gigantic islands, or collection of islands, that lie between Canada and Alaska and the North Pole, to the north of Behring strait, the Beaufort sea, and Melville island, and to the west of Ellesmere island.

The 20th century apparently belongs to Antarctica that giant continent, as large as all Canada and the United States combined that caps the southern apex of the globe under the Southern Cross already made tragically famous by the brilliant exploits and too often desastrous explorations of Ross, Borchgrevink, Nordenskjold, Balch, Fricker, Robert Scott, Amundsen, Shackleton and Nansen.

The last question of interest that remains to be answered in connection with these large polar island continents, so vast, desolate, barren and frozen, that lie in their lonely grandeur to the north and to the south is: Will they ever come within the range of human habitation and be of service to the human race?

A certain savant whose name is not at the moment recalled has formulated and advanced the theory a most plausible one, if true that, in addition to its diurnal rotation on its own axis and its annual rotation round the sun this mundane sphere, once in every 13000 years, takes a gradual tumble and reverses the position of the North and South Poles. This theory is a most attractive one and would clearly explain the glaciation and covering with a dense ice-cap, of the different portions of the earth's surfaces at *different periods*. It will also go far to explain the periodic upheavels and subsidences beneath the ocean of the land surfaces at long intervals of time; and the periodic flattening at the poles and simultaneous increase of the earth's bulk at the equator, caused by the greater force of the sun's attraction and by the centrifugal action of the earth as it spins round the polar axis. This theory would also account for the variation and constantly changing positions of the Magnetic Poles; and would similarly account for the occurence of new islands, volcanic cutbursts, and fissures as the stress and strain of the sun and moon's gravital attraction and the centrifugal force of axial rotation are slowly transfered from one portion of the earth's crust to another. This, too, would account for the gradual changes in atmospheric pressures, cyclonic disturbances, temperatures, ocean currents and seasons; and for the presence of extensive coal beds and mineral, marine and fossil deposits in the polar regions and also for the evidence of shifting centres of extreme glaciation in the temperate subtropical zones.

Should this theory be correct, the Poles are gradually rolling towards the Equator and the low-lying tropical lands, the Sahara, the Brazilian pampas and the great Missisipi Plain of America will, once more as they enter the Polar zones, gradually disappear beneath the relentless water of the mighty, invading ocean; and the high lands will become as Greenland, covered once more with a vast glacial ice-cap, and the forests of the tropical regions of to-day with all their luxuriant profusion, will be crushed into immmense coal-beds for the use of future civilizations.

At the same time the immense and potentially fertile plains, Mezozoic, Vivonian and Carboniferous, of Northern Siberia, the Mackenzie, Alaska, the Arctic islands, Petagonia and the Antartic Continent, as they slowly emerge into the Equatorial zone will be drawn still higher above sea-level and become the seedbed of mighty forests and their soil, further enriched by new fissuress from the bowels of the earth with every form of mineral expression, will become the resting place and seats of industry of future civilizations. Flourishing cities, factories and farms, will supersede the snow-huts of the primitive Eskimos and mighty fleets will sail the peaceful, sunlit waters of the Arctic ocean, whence the impenetrable ice-flœs and withering blizzards of the present day will have vanished. Then the natural waterways will be through the open straits of Bffian bay, Smith sound, Lancaster, Behring straits and the Greenland sea; and the history of our present civilization will be, for all earthily traces, as if it had never been.

Mr. A. P. Low the eminent Canadian Geologist, writing on this subject, says: "A new explanation must be found for the depression and subsequent uplift of the land covered by ice if the uplift be practically the same in northern Ellesmere, where the accumulation is as great to-day as at any previous timeȷ while in the southern part of Baffin island a great thickness o, ice was present during the glacial period and has now completely disappeared. Perhaps we have been taking the cause for effect, and the uplift due *to some unknown cause* may have been the cause of lessening of ice; certainly the almost rise equal of the land throughout the Arctic islands is an argument against the subsidence of the northern lands being due to the burden of ice-cap and the subsequent uplift due to the disappearance of this burden."

Perhaps the *unknown cause* referred to by Low is the constant and gradual variation of the position of the Poles and resulting elevation and depression of the earth's crust by the shifting of centrifugal action and the subjection of the different portions of the globe to different pressures as its angle of relation to the Sun is changed. As the Poles of to-day recede from their present position the glacial caps would gradually disappear and those portions of the globe as they slowly emerge towards the temperate and tropical zones, would be raised, while the portions of the globe's surface that replace them would gradually become depressed or partially submerged while the higher lands would become glaciated and covered with an ice-cap. In this case we might expect to find, in a certain period of time, possibly 2000 years, Lancaster strait occupying the present position of the Gulf of St. Lawrence and Hudson Bay a vast, undulating tropical plain, which had been raised by centrifugal action, above sea-level. At the same time the Antarctic Continent would move slowly into the realm of habitable domain and Siberia and Central Asia would push their way towards the North Pole and, in all probability, become submerged beneath the waters of the Polar Sea.

Perhaps, too the relative position of the Moon in its sinuous circuit round the Earth, may be slowly shifting all the time and thus have a constant tendency to cause the Earth to slowly roll over and over; and this motion maypossibly be accelerated from time to time by the periodic approach,at long intervals, of huge comets. Whatever the cause, it seems absolutely certain, from the abundance of evidence before our eyes, that the various portions of the surface of the globe do not rest indefinetely at the same angle to the sun but are constantly, if very slowly, always changing their *climatic* and physiographical conditions.

Low writes in his "Cruise of the Neptune":—From the character of the fossil plants found in these deposits (Ellesmere Land) there can be little doubt that during the Miocene at present, and approached a tropical condition.

One of the most remarkable geological discoveries of recent times has been that of the Miocene plant beds in North Greenland. Heer has described a flora extending at least up to 70°N., containing 137 species, of which 45 are found also in the Central European Miocene basins. More than half of the plants are trees, including 30 species of conifers (Sequionia, Tjuopsis, Salisburia, etc.) besides beeches, oaks, planes, poplars, maples, walnuts, limes, magnolias and many more. These plants grew on the spot, for their fruits in various stages of growth have been obtained from the beds. From Spitzbergen (70° 56″N. Lat.) 136 species of fossils plants have been named by Heer. But the latest English Arctic Expedition (Nares-Ellesmere Land) brought to light a bed of coal black and lustrous like one of the Palaezoic fuels, from 81° 45" lat. It is from 25 to 30 feet thick and is covered by blackwhales and sandstones, full of land plants. Heer notices 26 species, 18 of which had already been found in the Arctic Miocene Zone. As in Spitzbergen, the conifers are most numerous, (pines, firs, spurces and cypresses) but there occur also the arctic poplar, two species of birch, two of hazel, an helm and a virburnum, In addition to their terresttrial trees and shrubs the stagnant waters of the time bore water-lilies, while their banks were clothed with reeds and sedges. When we remember that this vegetation grew luxiriantly within 8° 15" of the North Pole, in a region which is now in darkness for half of the year, and is almost continuously buried under snow and ice, we can realize the difficulty of the problem, in the distribution of climate which these facts present to the geologist" (Encyclopedia Britannica).

"Under the Glacial of Pleistocene Period the whole of the north of Europe was buried under snow and ice and the greater portion of Britain was similarly ice-covered. The existing snow-fields and glaciers of the Pyreness, Switzerland and Norway are remnants of the great ice-sheets of the glacial period, while the arctic plants of the mountains are relics of the northern vegetation which was universal from Norway to Spain" (Encyclopedia Britannica.)

Low writes on this subject:—"Tyrrell's observations on the glacial phenomena of the barren land region west of Hudson Bay show that the country was intensely glaciated; that the centre of glaciation was on a nearly level plain now elevated some 400 or 500 feet above the sea-level, there being no evidence to show that it was much more elevated during the period of glaciation.

In the "The Cruise of the Arctic" Captain Bernier writes:—"The climate is regorous beyond what people in other climes will endure, but in my opinion, is improving slowly. Coastlines sheltered from north and east winds are much warmer than the shores exposed to those winds. The farther west our voyage extended, the better the climate became; even in a distance of 35 miles west, the temperature on Melville island was higher and Spring about one month earlier than where our ship wintered. I venture the opinion, arrived at by reading of the former expedition and comparing our own experience, that navigation in Lancaster sound, one hundred years from now, will be as easy as it is in Hudson strait."

From the evidence of the comparatively recent, from a geological standpoint, disappearance of an immense glacial ice-cap, noticed by Tyrrell on the west coast of Hudson Bay and by Dr Bell on the southern coast of Baffin land, from the gradual rise of the bed of James Bay, estimated by Tyrrell at Port Churchill at two feet raise in 150 years; from the comparatively recent emergence from the bed of the Polar Ocean of the Mesozoic strata that form the coast of the Parry and Swerdrup islands between

Latitudes 75° and 81° N., and between Longitude 80° and 120° west of Greenwitch; from the fact that in the period of less than a hundred years the minimum winter temperatures of Melville island has abated nine degrees (from 65° Fahr. as recorded by Parry in 1920 to 56° as recorded by the "Arctic" in 1909);

From the recent emergence from the Pacific Ocean near the south coast of Alaska of volcanix islands, steaming hot, and the recent heavy volcanic disturbances in Japan; from all these observed and recorded facts it would appear that there is abundance of evidence to support the theory that the present Polar regions have formerly been, not once but many times, situated in the Equatorial zone and that they are once more gradually emerging from the Polar zone and, in consequence, the crust of the earth in those regions is undergoing a continual change of stress as the centre of the centrifugal force is slowly transferred from one place to another.

All this would seem to offer proof that the northern hemisphere including Alaska, Northern Canada, Greenland and Northern Europe, between Longitudes 160 W., and 20° East are slowly rolling over towards the Equator and becoming warmer, and that the opposite hemisphere, comprising Northern Russia and Siberia are gradually approaching the Glacial area of the Pole and becoming colder and that a similar transformation is gradually taking place in the Southern Hemisphere.

A German scientist has recently remarked that deep cleavages in the earth's crust are slowly appearing along a line between the Persian gulf and the Polar Sea and he predicts that at some future date, in consequence, Europe will be separated from Asia and will become an island.

Geological Summary

Haughton.—The first attempt to delineate the limits of the different formations of the Arctic Archipelago, based on the results of the Franklin search and earlier expeditions, was made by Prof. Samuel Haughton (Journ Roy-Dublin Soc. 1858 I., 183-250). This geological map, which is reproduced with additions by the same author, in Mc Clintock's Narrative of the Discovery of the Fate of Sir John Franklin (The Voyage of the Fox, etc., London 1859) forms the basis of all subsequent maps.

Fielden and De Rance.—The most important observations on the geology of northern Ellesmere land were made by Fielden and De Rance of the British expedition of 1875-76. These and other observations to date were incorporated in the Notes to Accompany a Geological Map of the Northern Portions of the Dominion of Canada, by Dr C. M. Dawson. (Geol. Surv., Canada Amn., Rep 1886, R.)

Schei.—The most valuable contribution to the geology of the Arctic islands has been made by Mr Per. Schei, geologist on board the Fram, 1898-1902, in the Smith sound and Jones sound regions. (New Land, Captain Otto Sverdrup 1904).

Low.—The observations of Schei on the Cambrian, Silurian and Devonian formations of the southern half of Ellesmere islands are quoted in full by Dr A. P. Low in connection with his observations on the Silurian of Lancaster sound; and the best geological map to date, showing in colours the different geological formations of the Arctic regions of Canada, accompanies his volume. (The Cruise of the Neptune, Ottawa; Government 1906).

Boas Baffin Land.—Dr Franz Boas describes the nucleus of the mountain masses of Baffin island to be everywhere gneiss and granite with Silurian limestones about the region of the large lakes of the interior and along the low lands of the west coast. (Dr Franz Boas, Baffin Land, Petermanns Mitteilungon, Erganzunsheft, Nr 80, 1885).

Bell.—Dr R. Bell of the Geological Survey of Canada visited the north shores of the Hudson strait in 1884 and 1885, and again in 1897, when he made a close examination of the coast from the neighbourhood of Big Island to Chorkbak inlet near Gordon Bay. Dr Bell describes the prevailing rocks of the southern shore of Baffin as consisting of well stratified hornblende and mica-gneiss, mostly gray in colour, but sometimes reddish, interstratified with great bands of crystalline limestone, parallel to one another and conformable to the strike of the gneiss, which in a general way may be said to be parallel to the coast in the above distance. The direction, however, varies somewhat in different sections of the coast.

Arctic Archipelago.—This great archipelago extenging from 60° west longitude to 141° west longitude, and extending from the northern mainland of the continent of America northwards over some 20 degrees of latitude to the region of the North Pole, from the northeastern portion of the Dominion of Canada. It comprises some of the largest islands in the world, and has an approximate area of 600,000 square miles. The whole of this immense territory-explored at great cost by the British Government was in the early eighties given to the Dominion of Canada as a natural result of the surrender by the Hudson Bay Company of their vast territory to the south.

Physiography.—The data relating to the physical features of the inland portions of the Arctic islands are extremely meagre, owing chiefly to the difficulty of travel in the interior. The observations made upon the western islands by the various Franklin search parties, upon which we are to a great extent dependent for our information, were necessarily confined to the coast. The interior of the large islands of Baffin and Ellesmere likewise remain almost untravelled.

Prospecting.—Prospecting for minerals in the Arctic islands is a difficult and costly undertaking owing to the long sunless winter season, where everything is covered with a thick mantle of ice and snow, and to the expense attached to outfitting an expedition and hiring of a vessel and crew. Prospecting parties arriving in August would be obliged to spend one or more winters on the ground to do any effective work. Work could be carried on in the months of September, and October the first year and in the monthhs of May, June, July, August and September on the following year , before returning with the ship. The best months for sledge travel from one district to another are March, April and May when the ice is thick and the snow hard packed and when the sun shines bright with little wind. The mining laws are regulated by the Department of Interior, Ottawa, and are similar in character to the mining laws of British Columbia, Yukon, Alberta, Saskatchewan the Northern territory.

Tyrrell.—In 1893 and 1894, J. Burr Tyrrell, geologist, for the Canadian Government, made a report on the geology and general resources on the country west of Hudson Bay, lying north of the 59th parallel of latitude and embracing an area of about 200,000 square miles. The explorations included the examination and survey of the Telzoa or Doobaunt, Kazan, Ferguson, Chipiman and Cochrane Rivers, Chesterfield inlet, and the coast of Hudson Bay from Chesterfield inlet to Churchill, and two overland routes, travelled in winter with two dog teams and sledges between Churchill and Nelson Rivers. The illustrations, chosen from more than 400 photographs taken during the explorations.

give a better idea of the characteristic features of the country than extended descriptions. (See Report on the Doobaunt, Kazan and Ferguson Rivers and the north-west coast of Hudson Bay by J. Burr Tyrrell Part F. Annual Report, Vol. IX, 1896 Geog. Surv. of Canada).

Arctic Islands.—All the Arctic islands, lying to the north of the mainland of the American continent, with one combined area of some 600,000 square miles, equal in area to a fifth of the whole Dominion of Canada, formed part of the British Possessions in North America, by right of Discovery, dating from periods of 143 to 183 before the acquisition of Canada. They were formerly transfered to the Dominion by Order in Council of the Imperial Government on the 1st of September, 1880. In 1903-04, 1906-07, 1808-09 and 1910-11 the Canadian Government dispatched expeditions to winter in the northern waters of Hudson Bay and the Arctic Archipelago and to take formal possession by raising the British and Canadian flag over them and depositing copies of the Proclamations in cairns erected at various points.

The following is the list of the islands of the archipelago, having an area greater than 500 square miles:

Group I.—Southampton (19,100 sq. m.);

Group II.—Baffin (211,000 sq. m.) Bylot (5,100 sq. m.);

Group III.—Banks (26,400 sq. m.), Victoria (74,400 sq. m.); Prince of Wales (14,000 sq. m.); North Somerset (9,000 sq. m.); King William (6,200 sq. m.);

Group IV.—Ellesmere (76,600 sq. m.); North Devon (21,900 sq. m.); Bathurst (7,000 sq. m.); Cornwallis (2,700 sq. m.); Eglinton (700 sq. m.); Prince Patrick (7,100 sq. m.); Melville (16,200 sq. m.); Axel Heiberg (13,200 sq. m.); Ellef Ringnes (4,800 sq. m.); Amund Ringnes (2,200 sq. m.); King Christian (2,600 sq. m.); North Cornwall (600 sq. m.).

The resources of the Arctic islands include :

Resources Mineral.—Coal, Petroleum, Gypsum, Graphite, Copper, Silver, Shale Oil, Talc, Slate, Mica, Mobybdenite, etc.

Fauna.—Musk-ox. Arctic Caribou, Polar Bear, White and Blue Arctic Fox, Wolves, Arctic Hare, Arctic Salmon, Trout, Char, Geese, and Ducks, Ptarmigan, Seals, Walrus, White-whales, Narwhal, etc.

Commercial Products.—*Skins* of Musk-ox, Polar Bear, Arctic Fox, Wolves, Caribou, Seal, Walrus, White Whale and Narwhal;

Oil.—Of whales, walrus, white-whales and Narwhal and seal.

Fish.—Salmon;

Ivory.—of Walrus and Narwhal;

Seal Boots made by the Eskimos.

Rock Classification Huronian.—To give the reader a better comprehension of the rock classification in these regions, it will be well to explain that the Huronian represent white quartzites and the greenish quartzites, intimately associated with eruptive rocks, and also diabase and gabbro. Dark green eruptive rocks, chiefly diabase, often very much squeezed and altered, are largely developed in the Huronian, composing a considerable proportion of the rocks of this system. On the west coast of Hudson Bay, on Melville and Borden Peninsula, these are cut with many white quartz veins, highly charged with iron and copper pyrites. *Silurian* and *Cambro-Silurian* represent the different varieties of Limestone, the *Cambrian* represents Athabaska sandstone and conglomerate. Masses and dykes of dark-green basic eruptive rocks, such as pitch stone, diabase, minette, etc., flows and dykes of reddish acid eruptive rocks, such as rhyolites or quartz porphyries, andesites, angite-porphyrites, etc., and Churchill arkose. *The carboniferous* comprise the sandstones and slately clay in which bed of lignite coal are found. *The Cape Rawson beds* are composed of large slabs of slate in association with black shales and sandstones in which are found extensive deposits of Fossils and also large deposits of bituminous coal.

Mesozoic.—The Secondary or Mesozoic, Triassic or New Red Sandstone overlie the Carboniferous rocks below, and include Quartzose pebble-beds and soft bright-red and varieted sandstone, without pebbles, conglomerate with base of calcareous breccia; white, brown or reddish sandstones, micaceous sandstones and marls (waterstones) passing downwards into red, green and grey marls, red and grey shales with beds of rock-salt and gypsum.

The Mesozoic rocks of the Arctic basin consist largely of sandstones with shales, schists and limestones. *Archeaen rocks* include crystalline gneisses, schists and granites, which often contain small flakes of graphite and iron pyrites. *The term Laurentian* applies to the crystalline, massive or altered, crushed and contorted rocks of Fundamental Gneiss or "Basement Complex" consisting of granites and diorites-gneisses which it has so far been impossible to separate in any definite time-series.

A. P. Low in his "Cruise of the Neptune" writes: "There is a marked difference in the evidence of the intensity of glacial action between the southern regions and the eastern and northern portions of the great area embraced in this report. On the shores and islands of Hudson Bay and Hudson Strait the crystalline rocks have been denuded of every trace of rotted surface material; then have been smoothed, polished and intensely striated, and their present conditions is such that little or no change has taken place since the disappearance of the ice, which once covered them deeply, the striae being so fresh as to appear of formation of yesterday. When the eastern mouth of Hudson Strait is left a change is soon seen in following the eastern side of Baffin's Land northward. The hills are less rounded, and talus lies on the slopes of the cliffs; about Cumberland gulf and Cyrus Field bay there is evidence of a universal ice-cap having been present, but rounding, polishing and striation of the rocks are markedly less than the south and westward. In these places, and these when found show that the movement was local and from the highlands towards the open sea. In the northern part of Baffin island the hills become more serrated in outline, and many of the higher points appear to have never been subjected to glaciation, the glaciers having only filled the valleys; if an ice-cap existed the ice movement to the coast was determined by the course of the local valleys, and there is no evidence of a movement not depending upon local conditions as is the case in the region about Hudson bay. At Erik harbour, on the south side of Ponds Inlet, there is evidence that the glacier which now terminates at the head of the harbour once extended five miles farther seaward, and filled the valley to a height of 100 feet above the present level of the sea. Above that height the rocky walls of the harbour are not glaciated, and are covered by slopes of desintegrated rocks. Passing north of Lancaster sound to the south of North Devon, there is little evidence to show that the glaciation was ever much more severe than at present. At Cuming Creek, a narrow fiord cut some twelve miles into the limestone cliffs, there is evidence that a glacier once covered its bottom, and rose some 2 or 300 feets above the present level of the sea; but it was purely local, and the limestone cliffs everywhere show that they have been long subjected to subaerial denudation, and that the broken rock covering their sides have never been displaced by ice.

Cape Sabine.—"Very little time was given to the study of glaciation at Cape Sabine, and the only evidence to show that it was more intense formerly was a low moraine in rear of Peary's house at Payer harbour. Schei, who devoted considerable attention to the glaciation of Ellesmere is of the opinion that the ice covering never greatly exceeded its present limits, if it did at all.

Dr Bell in his report on the geology of Hudson Bay and Hudson Strait, 1885, drew attention to the flow of the ice from the land on both sides of the strait into that body of water, while the striæ on the islands in the strait show that a great stream of ice passed eastward through the strait from Hudson Bay into the north Atlantic. These observations have since been confirmed by observations of the striæ on other islands of the strait.

From the observations of McClintock and others on the distribution of drift boulders over the western islands. Proof. Houghton came to the conclusion that the drift had been northward and due to floating ice. In an able summary of the evidence provided by erratics, and by masses of Copper thought to have come from the Coppermine river—which were said to have been picked up by the natives in Prince of Wales strait, Dr Dawson concluded that the movement of the glacial drift had been from south to north over practically the whole area. Tyrrell located one centre of the great ice-cap near the north and west and the head of Chesterfield inlet, west shore of Hudson bay, and inferred that the moisture necessary for such an accumulation of ice was derived from an open Arctic sea. Later, when the ice increased in thickness, the centre of dispersion moved to a position southwest of Baker lake; while as the glacier diminished the centre moved nearer the seashore, and the final stage was probably represented by the ice-cap breaking up into a number of distinct glaciers, each with a local movement of its own.

Low writes on this subject:—"Tyrrell's observations on the glacial phenomena of the barred land region west of Hudson bay show that the country was intensily glaciated; that the centre of glaciation was on a nearly level plain now elevated some 400 or 500 feet above the sea-level, there being no evidence to show that it was much more elevated during the period of glaciation. The centre of ice distribution was situated close to the western shores of Hudson bay, and the moisture sufficient to allow of such an accumulation of ice was probably derived from an open Arctic sea. The glacier moved south and southwest from this centre up a gradual grade to Manitoba, where morainic accumulations are found on the summits of the Duck mountains at elevations from 1800 to 2400 feet above present sea-level Striæ evidently formed by moving ice from this centre have been found by Dr Barlow and the writer on the branches of the Moose river to the south of James bay, where the movement was from the northwest. There is little doubt that the ice also moved northward from the centre of glaciation, and that the evidence quoted above of the erratics found in the western Arctic islands is proof of this. The conclusion of Tyrrell as to the southern movement of the centre of glaciation are borne out by the writer's observations of the striæ along the shores of Rœs Welcome where as many as six sets of striæ were found at Whale point, the usual number being three. The oldest set, found only at Whale point, showed that the ice movement was from the northwest. The next in age were from N. 50°E., or almost at right angles to the oldest; following in order of age some striæ from N. 25°E., N., N. 30°W., and N. W. last three sets are found in a number of places between Winchester inlet and Whale point; the others only at Whale point. The direction of the above sets of striæ apparently shows that the earliest accumulation of ice in the region north of the western side of Hudson bay was somewhere to the northwest this was followed by an abrupt change in the ice-movement which was next from almost northeast, after which the centre of the movement of the ice-cap gradually shifted, by way of north to northwest. It would also appear that the centre of dispersion were much greater in area than the limits placed upon them by Tyrrell.

"This southern movement of the centre of dispersion of the ice is diametrically opposite to what occured in the case of the ice-cap of Labrador, where the striæ along the east side of Hudson bay show that the centre of ice-movement changed from a position near the central area of the peninsula, a short distance north of the southern watershed, to one some 300 miles north, in the vicinity of the headwater of the Koaksoak river."

"The glaciation of Labrador seems to have been later than that of the western side of Hudson bay, as the striæ from the western glacier are almost obliterated by those from the east and northeast along the rivers south of James bay."

Geological Summary

Laurentian granite Ellesmere Land.—Low writes:—"The granite seen at Cape Sabine and Cape Herschel is an ordinary Laurentian granite, and it no way resembles the acidic rocks of Tertiary or Post-Fertiary age. The sandstones, limestones, and their associated traps bear a close resemblance to portions of the Huronian series found on Hudson bay and in the interior of Labrador. There is also a similarity between their contacts with the Laurentian granite and some of the contacts found in these rocks, and until such are found it is thought best to remove the series from the Tertiary and place it in the Huronian. Both the Laurentian and Huronian divisions of the Archaean are represented in the area.

Rocks of Arctic Island.—"The rocks of the Arctic islands and of northern coasts of the continent present an almost continous ascending series from the Archaean to the Tertiary, while the upper loose material represents various phases of the glacial age and of the subsequent Post-glacial deposits.

"Only isolated attempts have been made to subdivide the Archaean complex into Laurentian, Huronian and other menbers of the system. This lack of subdivisions is due to want of detailed knowledge; not to the absence of the various members of the complex in these northern regions, where the greater number of the members are known to occur.

East Coast Hudson Bay.—"The rocks of the entire east coast of Hudson Bay are very ancient and with the exception of those which form the chain of islands along shore between Portland promontory and Cape Jones, and also a narrow margin on part of the coasts in some regions, they have all been cut by granite which has not only intimately penetrated them, but by its heat and pressure have so changed them to crystalline schists and gneisses that only in a few places can any trace of an original sedimentary origin be found. The unaltered sedimentary rocks with their associated sheets of trap and diabase bear not only a remarkably close resemblance to the so-called cambrian rocks of other parts of Labrador peninsula, but also to the iron-bearing rocks of the southern shores of Lake Superior and the Animike and Nipigon rocks to the north of Lake Superior.

Palaeozoic.—"The Palaeozoic rocks are well represented on the islands by thick deposits extending upwards in a continuous series from the Cambro-Silurian to the upper beds of the Carboniferous. Rocks older than the Galena-Trenton are only found in the northern part of Ellesmere island, where a series of beds appear to connect the Upper Huronian formations with the lower members of the Cambro-Silurian.

Mesozoic.—Mesozoic rocks are found on the northern Parry island, on the Sverdrup group and on the western and northern sides of Ellesmere island."

Parry & Sverdrup Islands.—The Parry islands include Melville, Byam, Martin, Prince Patrick, Cornwall's and Bathurst. The Sverdrup islands comprise Ellef Ringnes, Amund Ringnes, King Christian and North Cornwall.

Tertiary rocks.—"Tertiary formations occur on the north-western islands, on the northern part of Ellesmere, as well as on the northern and eastern parts of Baffin island.

Earth movements.—"The sequence of earth movements and physical conditions, read from the geological formations of the north-east, are as follows: "An ancient floor of crystalline rocks, largely of igneous origin, represents the most ancient crust of the earth. These, associated with ancient bedded deposits and cut by dark basis intrusions of trap and allied rocks, were at a very early period so crushed and foliated that it is now impossible to separate them. Upon this ancient complex was laid down a series of bedded deposits, chiefly sandstones and dolomites associated with contemporaneous traps, as may be seen along both the shores of Smith sound. Following this came a great outburst of granite and other acidic igneous rocks which, over large areas, inclosed, penetrated, compressed and otherwise altered the sedimentary deposits to such an extent that it is now impossible to separate them from the older complex upon which they were originally deposited. Only in a few comparatively small areas were the conditions of the granite intrusion such as to allow the sedimentary deposits to preserve their original unaltered conditions. All the above rocks are grouped in the Archaean, and further and closer examination will probably show that it contains all the members of Laurentian and Huronian found in the more southern Archaean regions of Canada."

Granite and Huronian contact.—"An examination of a number of the contacts between the granite and Huronian rocks shows an alteration, from a slight crumpling and baking to highly tilted and contorted crystalline schist and gneiss. The accompanying basic igneous rocks, originally fine-grained traps or diabase, are changed in like manner to strongly foliated hornblendic and chloritic schists, usually freely penetrated by quartz veins holding quantities of pyrite and other minerals.

Wager Inlet.—"The granites prevail about Wager inlet, but there are more and larger areas of the dark basic rocks about that great bay than to the southward, making it a more promissing field for economic minerals, especially as these basic rocks generally carry sulphides, and Rae reported free gold to have been found about the head of the inlet.

Huronian area.—"The largest area of Huronian rocks found in this district, extends more or less continuously for 120 miles along the west coast of Hudson bay, from near Baker's foreland to a point 45 miles north of Cape Esquimaux.

West Coast, Hudson Bay.—"In one place near the cache on the west side of Hudson bay, a thickness of 60 feet of quartzite, in a nearly vertical attitude, was seen almost in contact with the Laurentian gneis, there being but a narrow, drift filled gap between the two. This would indicate either the existence of a fault, or that here the quartzites are the base of the Huronian subsequent to the deposition of the quartzite.

Sedimentary Rocks.—"Except in the northern part of Ellesmere there is a considerable time-break in the geological sequence in the northeast between the Archaean rocks and the Cambro-Silurian strata which rest uncomformably upon them. Schei, the geologist who accompanied Sverdrup's expedition in the "Fram" in 1899-1902, found at Bache peninsula, on the eastern side of Ellesmere, a series of stratified sedimentary rocks resting upon the northern flank of the Archaean and containing fossils of Cambrian age. These deposits have a thickness of nearly 1500 feet, and are overlaid by limestones containing Cambro-Silurian fossils.

Archaean Rocks.—"The Archaean rocks at the time of deposition of the lower beds of the Cambro-Silurian limestones appear to have extended southward from the vicinity of Bache peninsula in a gradually widening ridge, along the western side of Baffin bay and Davis strait. In this manner they attained a width of 70 miles on the southern side of North Devon, and occupied the entire southern shore of Baffin island, being separated from the great area of Labrador by the depression of Hudson strait, which probably existed at that early period. Islands of Archaean rocks may also have risen above the surface of the Cambro-Silurian sea in the present island of North Somerset and on Melville and on Boothia Peninsulas, as well as on the other portions of the northern coasts of the mainland, to the west of Hudson bay.

Cambro-Silurian Sea.—"The western Cambro-Silurian sea fitted the present depression of Hudson bay, and extended forth to the south and westward of its present limits, outliers of limestone containing fossils of this age, and very similar in mineral character, being found in the valleys of the great lakes of Manitoba. From Manitoba these rocks have been traced southward into the Unites States, so that at the time of their deposition the Cambro-Silurian sea occupied a great basin open to the Arctic Ocean and extending southward into the middle of the continent.

Fossil strata.—"On the southern side of Ellesmere there is a complete succession of strata, fossils from Middle-Silurian age up to the Upper Devonian. These strata have an aggregate thickness of 8000 feet, and form the thickest and most carefully measured section of the Silurian and Devonian beds of the Arctics.

Ocean recedes.—"This was the time of maximum encroachment of the northern ocean, after which the land gradually rose, and the sea slowly receded. Owing to the great lapse of time and the eroding of the thick ice-cap in the more southern regions, it is exceedingly difficult to now trace the boundaries of the narrowing sea during Silurian and Devonian times. Cambro-Silurian limestones containing fossils which refer to Galena-Trenton, are widespread over the northern islands and in a wide margin along the western and southern shores of Hudson bay. Outliers of these rocks occur at the head of Frobisher bay, on the southeast part of Baffin island and on Akpatok island in Ungava bay. As before stated, similar limestones are found in the lake valleys of Manitoba, it is quite possible that these limestones were once continuous with those of Hudson bay, the present break having been caused by the erosion of the glacier.

Silurian limestones.—"The upward continuation of these limestones containing Silurian fossils occupied a corresponding but slightly circumscribed area. These Silurian limestones form the characteristic abrupt cliffs of the islands on both sides of Lancaster Sound, and continuing southward occupy the larger part of Southampton coasts and Mansfield island in Hudson bay as well as the low lands of the western part of Baffin island. They are not well marked, and are probably considerably thinner on the western side of Hudson, bay, but are found in the Winnipeg basin.

Silurian.—The yellow and drab limestones of this age have a wider distribution than that of any other formation on northeastern America, extending as they do, from Ellesmere island to Victoria island and to western Baffin land on either side of the Archaean spur. No distinctive break separates these marine sediments from those of the Ordovician below or the Devonian above.

Silurian fossils have been collected by Mc Clintock and others, from the following localities: North of Jones sound from South Cape to Hell Gate; the upper part west of Bjorneberg; Cornwallis island-south-east extremes; Griffiths island east end; Browne island; Bernier Bay and Port Leopold on North Somerset; Cape York-south side of Lancaster sound; Possession Bay-Bylot island; Port Bowen and Fury Point in Regent inlet; Depot Bay-Bellot strait; East Boothia-Cape Farrand; West Boothia-vicinity of the Magnetic Pole; Prince of Wales island-east side; King William island-west coast; Princess Royal islands; Prince of Wales strait.

Crystalline Limestones.—Dr Bell writes "The distinguishing feature in the geology of the southern part of Baffin land is the great abundance, thickness and regularity of the limestone associated with the gneisses. At least ten immense beds, as shown in the accompanying map, were recognised, and it is probable that the two others, discovered in North Bay, are distinct from any of these. There would, therefore, appear to be twelve principal bands as far as known, to say nothing of numerous minor ones, between Icy cape and Chorkbak inlet. The limestones are for the most part nearly white, coarsely crystalline, and mixed with whitish felspar. The limestone usually contain scattered grains of graphite, and among the other minerals which commonly occur in the various bands are mica, garnet, magnetite, pyrite, and hornblende.

"As to the total thickness of the twelve bands of crystalline limestones which have been mentioned as occurring in this part of Baffin Land, the available data on the subject are not sufficient to form a correct estimate but on adding together their probable approximate widths it seems to be no exageration to place their possible total volume, great as it may appear, at about 30,000 feet, or on an average of 2500 feet for each of the principal bands, taking no account at all of the smaller ones.

On this subject Dr Low writes:—"At present we know that highly crystalline equivalents of some of the Huronian limestones. This probably is the case in Baffin Island, where these rocks with the accompanying gneisses represent a highly metamorphic phase of portions of the Huronian, while others of the gneisses are the foliated state of the masses which caused the alteration of the limestones. This would correlate the rocks on the north side of Hudson strait with the altered Huronian rocks of northern Labrador, where in places similar crystalline limestone occur. The Huronian rocks of Labrador are marked by the number of repetitions of the strata caused by thrust faults in all the areas examined, and this repetition of measures by similar faults may account for the number of bands of limestone found in the southern part of Baffin island."

The Cumberland gulf region has been dealt with in brief in Dr Low's report, which contains a summary in full of the observations made in the different Archaean regions.

Devonian.—Dr Low writes:—"The Devonian gradually emerges from the Silurian in the cliffs of the islands to the north of Lancaster sound, and forms the lower parts of the cliffs of the southern side of Ellesmere. Devonian fossils are not found in the limestones of the islands of Hudson bay, and only occur in a narrow belt on the low lands to the west and southwest of James bay, similar rocks from the upper beds of the Winnipeg basin.

The only one of the early expeditions which collected fossils of Devonian age was that of Sir George Nares to Robeson channel and northern Ellesmere Land. These were found in Dana Bay, latitude 82° 30′ north. Our knowledge of the Devonian of this region is due almost entirely to the researches of Schei in southwestern Ellesmere land, where beds of this age occur. These include above series (C) which may be either late Silurian or early Devonian, a series (D) of 55-60 fossils corresponding to those of the Lower or Middle Devonian, and a series (E) of quartz sandstones, 900 to 1200 feet in thickness containing fossils characteristic of Upper Devonian.

"The work of the older geologists" says Low, "which was summarized by Haughton and later by Dawson, took no account of the Devonian in their divisions of the Palaezoic rocks of the north of Lancaster sound. All the lower limestones were classed as Silurian, while the overlaying sandstones were placed in the Carboniferous. Fossils of Devonian age were collected, by the expedition of 1876, from the northern part of Ellesmere, but their occurence and relations were only finally settled by Schei as given above. From his observations it is plain that the upper part of the limestones and the lower 100 feet of the overlying sandstones are of Devonian age. The early explorers were not trained geologists and it could hardly be expected that they would discover the thin bands containing fossils in these great thickness of barren beds. Owing to this supposed lack of fossils the rocks were separated into Silurian and Carboniferous almost wholly on lithological differences, the limestones being classed as Silurian and the sandstones as Carboniferous."

"There is no doubt that Devonian rocks are included in the Carboniferous of the western Parry islands, but as they occur only in the cliffs underlying the Carboniferous beds that cover the surface of the islands, it would be impossible to map them on the scale used in illustrating this report, and in consequence the old colouring followed here.

Carboniferous Rocks.—."There is no break in the passage from Devonian to Carboniferous in the rocks forming the Parry islands and the southern part of Ellesmere, where carboniferous rocks occupy wide areas on these northern islands, but are not found to the southward of Lancaster sound, showing that the Palaeozoic sea had retreated far north before the close of the Devonian.

"The southern boundary of the Carboniferous sandstones with their included coal seams across the southern part of Banks island in a north-north-east direction and they consequently cover the northern two-thirds of that island, while the extreme north-west portion of Victoria island is also occupied by these rocks. The western Parry islands, on the north side of Melville sound, are almost wholly formed of these rocks, whose southern boundary strikes northeast across the northern half of Cornwallis island. They are found again in Grinnell peninsula the northwest portion of North Devon and again on the northwest side of Ellesmere, in the vicinity of Store Bjornekap, being probably largely developed in the north-east part of that great island.

"These rocks are described as follows by Prof. Haughton: "The

Upper Silurian limestones, already described are succeeded by a most remarkable series of close-grained white sandstone, containing numerous beds of highly bituminous coal and but few marine fossils. In fact the only fossil shell found in these beds, as far as I know, in any part of the Arctic Archipelago is a species of ribbed Atrypa, which I believe to be identical with the Atrypa fallax of the carboniferous slate of Ireland. These sandtone beds are succeeded by a series of blue limestone beds containing an abundance of marine shells, commonly found in all parts of the world where the Carboniferous deposits are at all developed. The line of junction of these deposits with the Silurian on which they rest is N. E. to E. N. E. (true)Like the former, they occur in low flat beds, sometimes rising into cliffs, but never reaching the elevation attained by the Silurian rocks in Lancaster Sound."

"The earliest rocks of this age-from their relationship, likely lower Carboniferous consist of a remarkable series of light coloured sandstones, often cross-bedded and more or less friable, clayey of the Carboniferous and shales.

"The southern boundary of the Carboniferous sandstones with their included coal seams crosses the southern part of Banks island in a north-north-east direction, and they consequently cover the northern two-thirds of that island, while the extreme north-west portion of Victoria island is also occupied by these rocks. The western Parry islands on the north side of Melville sound are almost wholly formed of these rocks, whose southern boundary strikes north-east across the northern half of Cornwallis island. They are found again in Grinnell Peninsula, the north-west portion of north Devon, and again on the western side of Ellesmere, in the vicinity of store Bjornckap, being probably largely developed in the north-east part of that great island. Respecting the coal seams which have been discovered in the Arctic Archipelago. Professor Haughton remarks: "If the different points where coal was found be laid down on a map, we have, in order, proceeding from the Southwest, Cape Hamilton, Baring Island; Cape Dundas, Melville island, Schomberg point, Graham Moore bay, Bathurst island; a line joining all these points is the outcrop of the coal beds of the south of Melville island, and E. N. E. At all the localities above mentioned, and indeed in every place where coal is found, it was accompanied by the grayish-yellow and yellow sandstone, already described, and by nodules of clay-ironstone, passing into brown hematite sometimes nodular and sometimes pisolitix in structure."

"It is doubtful if the Carboniferous rocks occur in the north-west part of North Devon, though placed there by De Rance and Dawson. Schei found only Silurian and Devonian in the northern part of that island explored by him, and the Carboniferous rock do not show on the west, coast of Ellesmere until Store Bjornekap is reached."

"The Carboniferous rocks of western Ellesmere appear to be isolated areas resting upon the underlying Devonian, and in turn covered by Mesozoic rocks."

"The extreme northeast of Axel Heiberg island is marked as Carboniferous by Schei, but there are no notes concerning this locality in his geographical summary."

"The carboniferous sandstones have not been found in the north-west part of Ellesmere island, but limestones of that age were found in several localities to the west of Dana bay, and there is every likelihood that rocks of this age extend across the northern part of the island to join those of the western shore and the northern part of Axel Heiberg island."

McClintock states that: "Point Wilkie, Prince Patrick island, appear to be an isolated patch, of Liassic age, resting upon Carboniferous sandstone and limestone, with bands of chert, of the same age as those of Melville island. The eastern shore of Intrepid inlet is composed of this formation; while the western is of the underlying Carboniferous rock."

"The condition present from Ordovician times of a continuously emerging continent, gave place during this period to a submergence of the land, as evidence by these limestones which overlie sandstones of Farly Carboniferous and Devonian age.

Mesozoic.—"The land rose above the ocean at the close of the Carboniferous, and with the exception of the northern parts of the Parry islands, the Sverdrup group and the western part of Ellesmere has not been deeply submerged since. Rocks of Mesozoic age, belonging to the Alpine Triassic, have been found in the last-named places, but in no other localities to the southward within the limits of this report.

"Considerable earth movements occured at the close of the Mesozoic period, causing those and older rocks to be highly titled and folded.

"This discovery of the Sverdrup group of islands has greatly extended our knowledge of the Mesozoic rocks of the Arctic basin. The Franklin search parties discovered rocks of this age on the northern shores of the Parry islands; at Point Wilkie, in Prince Patrick island; Rendez-vous Hill, near the north-western extreme of Bathurst island and at Exmouth island and places in the vicinity, near the northwest part of the North Devon. The explorations from the Fram now show that these are but the southern edge of a wide basin of these rocks which form the islands of King Oscar, Ellef and Amund Ringes, while they constitute the low lands of Axel Heiberg and the western shores of Ellesmere along both sides of Eureka Sound. There they consist largely of sandstones with shales, schists and limestones."

"As before stated, Schei hints that their eastern extension to the shores of Kennedy channel may be marked by the tilted and folded strata, classed by De Rance as the Cape Rawson series, of supposed Cambrian age."

McClintock makes the following observation: "At Wilkie Point, Prince Patrick Island a few hundred yards from the beach there are steep hills about 150 feet in height, and upon the side of these, in reddish coloured sandstone, cast of fossils shells abound. These were examined by Prof. Haughton, and described or named as follows: Amonites McClintocki, Monctis Septrionalis, Pleurotomaria sp., Nucula sp., and a cast of univalve. Professors Neumayr and Waegen when consulted referred the ammonite to the Jurrassic. This view was taken by the Royal Geological Society.
Professor Haughton remarks in his treatment of the Mesozoic Geological appendix referred to above, that, "Captain Sherard Osborn found broken vertabrae of an icthysaurus, 150 feet up Rendez-vous Hill, at the northwest extreme of Bathurst island.

Sir Edward Belcher observes, regarding the locality on Exmouth island: "The summit is capped by a reddish limestone formation of about one fifth of the entire height, resting on friable, disintegrating sandstone, having a dip at its western end of 7°. Salter identified from this limestone, fossil remains of vertabrae and portions of the rib of an ichthysosaurus, Spirifer, Keilhair, and Productus cora.

Eruptive rocks are included in this series of Triassic sediments.

Miocene Tertiary.—"Another slight submergence took place in the Miocene Tertiary, when shallow water deposits of sand, gravel and clay, associated with beds of lignite, were laid down in the wide valleys along the margin of several of the Arctic islands. Such deposits are known to exist in Banks islands, on the western side of Ellesmere and along the northern and eastern sides of Baffin island. There is little doubt that other deposits of this age will be discovered when more systemathic search has been made for them in these northern regions. From the character of the fossils plants found in these deposits there can be little doubt that during the Miocene the climate of these northern islands was much warmer than at present and approached a tropical condition.

"The knowledge of the Tertiary deposits of the east side of Ellesmere is summerized as follows by Dawson: Small outlying areas of Tertian (Miocene of Heer) are noted as occurring at Water-course bay, at the entrance of Lady Franklin Sound, and in two places at the north shore of the sound. Coal is found in these beds in association with black shales and sandstones, and from collections made by Captain Fielden and Dr Moss, Prof. Heer describes thirty species of plants closely allied to the Spritzbergen Tertiary flora, and indicating rather colder conditions than are expressed by the character of the Disko island Tertiary plants. The coal appears to be an excellent fuel, containing only 2.01 per cent of water.

Marine Terraces Uplift of Land.—"The conditions of the land and water surfaces during the Glacial period differed little from those at present, except that these have been a considerable uplift of the land as proved by the marine terrace found along the coasts. The maximum uplift probably amounted to 700 feet along the eastern side of Baffin island, and was perhaps slightly less on the islands farther north, where Scheis reports beaches 600 feet and upwards above the present sea-level. This being the case, a new explanation must be found for the depression and subsequent uplift of the land covered by ice, if the uplift be practically the same in northern Ellesmere, where the accumulation is as great to-day as at any previous time, while in the southern part of Baffin island a great thickness of ice was present during the Glacial period and has now completely disappeared Perhaps we have been taking cause for effect, and the uplift due to some unknown cause may have been the cause of a lessening of ice; certainly the almost equal rise of the land throughout-the Arctic islands is an argument against the subsidence of the northern lands being due to the burden of the ice-cap, and the subsequent uplift due to the disappearance of this burden."

Tertiary.—T. G. McMillan, Geologist, in the "Cruise of the Arctic, 1908-09" writes: "Deposits of this age, often containing seams of coal have been found in many widely separated areas in the Arctic islands. They consist for the most part of sand, and are not readily distinguished from later deposits. In the region about Davis strait, these include besides the sediments, considerable thickness of volcanic eruptives. Cape Searle is formed of at least 800 feet of volcanic agglomerate and stratified tuff."

"The localities where Tertiary beds have been found, include the following: Durban island, Isabella bay, Eclipse sound in Baffin island and Cape Hay on Bylot island, lignite being found at Durban island and Cape Hay; in various places between the 81st and 82nd parallels about Lady Franklin sound, as outliers on the Cape Rawson beds—Mesozoic?—bituminous coal being found near Cape Murchison, Lake Hazen and Lincoln bay—82nd parallel. These areas have been fully dealt with in the works referred to."

Low reports: "In many places along the western side of the Ellesmere in the depressions between the mountains, thick deposits of sand with embedded strata of lignite were found. Similar deposits were found in the lowlands east of Blaamandan, and at the head of Stenkulfiord in Baumann fiord. "In addition to the lignite, masses of slaty clay were in the latter place, in which were well preserved remains of Sequoia Langsdorfii, Taxodium distichum var, miocenum and some others, well-known witnesses to a southern vegetation in these regions in a geologically late period, i. e., the Miocene."

Low writes: "The Tertiary coal-bearing formation is evidently much more widely spread in the part of Grinnell land, in the vicinity of Lady Franklin sound, than the previous quoted map of Messrs Fieldon and DeRance would indicate, though it may probably be regarded as forming detached outliers (which I do not venture to outline) on the Cape Rawson beds, shown by these authors to characterize the region generally. Bitumunous coal was found at Lincoln bay, half a degree north of the mouth of Lady Franklin sound, on the east Grinnell land coast, in different parts of the Bellows valley (which runs inland to the north of the same sound) to the head, and in the neighbourhood of Lake Hazen, to the westward, by Captain Greely. Lieut. Brainard also describes in an appendix a fossil forest discovered by him Archor fiord, a few miles west of Cape Baird, which, with the associated rocks, is without doubt referable to the Tertiary."

"To the west of the narrows of Ponds inlet, Salmon River, the high hills of crystalline rock retreat from the southern shore of the inlet, leaving a wide plain of stratified sand, gravel and clay, which extends far to the west and southwest, and is penetrated by a number of deep bays on that side of the inlet. This plain is indented by all the rivers traversing it, and in the beds of the streams broken lignite is found, evidently fallen from beds of that mineral in the banks above. The pressure of lignite in these stratified deposits point to their being Tertiary in age, and corresponding with the northern areas of this formation already described as lying undisturbed in the wide valleys of the older rocks."

"There is little doubt that other areas of these Tertiary deposits occur on the Arctic islands, but owing to no lignite or fossils having been found in them they have not been separated from the drift and newer post Tertiary deposits of sand, gravel and clay of these coasts."

The deposits of Ballast beach, Banks island, are described by McClure, as follows: "Extending along a range of hills varying from 350 and 500 feet above the sea, and half a mile upwards, inland, there are great quantities of wood, some of which was rotten and discomposed, but much of it sufficiently fresh to be cut and used for fuel. Whenever this wood was in a well-preserved state, it was either detected in ravines, or had been recently exhumed from the frozen sail. "Armstrong says of the area: "Trunks and branches of trees one 25 by 26 inches in diameter and another three feet in circumference, were found in loamy soil at an elevation of 300 feet. Some of these were quite fresh but hard and dense; others dark and semi-carbonized. Some approached lignite in character; others were impregnated with limonite and silicified. Pine cones, etc., were among the remains. Several miles inland at an elevation of 600-700 feet, similar conditions prevail."

Mecham's journal contains this description of another area: "On the return across Prince Partick island, in a ravine west of the head of Walker inlet, a large tree four feet in circumference was observed protruding ten feet from the bank. Parts of other trees showed just above the white sandy soil one was 30 feet long and another 34 inches in diameter. The wood was similary to that found at an elevation of 90 feet in the cliff at Cape Manning, the southwest point of the island. "Dr Oswald Heer in his Flora Fossile Artica (I., 1868; II., 1871; V., 1878; VI., 1880) refers this wood to the Miocene in which the following species are described by Cramer: Pinus MacClurrii, Pinus Armstrongii, Cupressimoxylon cfr. pulchrum, polyommatum, bubium and Betula McClintocki.

From these observations it is apparent that the southwest of Prince Patrick island, and portions of the northwest of Banks island are occupied by Tertiary sediments. The remainder of Prince Patrick island, excepting the Mesozoic area about Wilkie point, has been mapped by Haughton as consisting of Carboniferous limestone. The journals of McClintock make no mention of limestone being found on Prince Patrick island, except on the west side of Intrepid inlet." It seems much more probable that the western portion of the island, at least is occupied by sediments of Tertiaryage McMillan.

Schei found Tertiary fossils on the northwestern point of Graham island, and form the description of the Ringes islands, by Captain Isachsen, it seems not likely that these, too, may be of Tertiary formation.

Post Tertiary.—Low writes: "Little or no attention was given by the earlier explorers to the markings of ice-stria and other glacial phenomena, and the early records of the movement of the glacial ice noted by them was the distribution of erratic boulders. These observations have been summarized by Dawson as follows: "Along the Arctic coast, and among the islands of the Archipelago, there is a considerable volume of evidence to show that the main direction of movement of erratics was northward. Thus, boulders of granite supposed by Prof. Houghton to be derived from North Somerset are found 100 miles to the north east ward, and pebbles of granite, identical with that of Granite Point, also in North Somerset, occur 135 miles to the northwest. The eastside of King William land is also said to be strewn with boulders, which shows the direction and distance and travel of the gneiss of Montreal island, to the southward. Prof. Houghton shows the direction and distance of travel of some of these fragments by arrows on his geological map of the Arctic archipelago, and reverts to the same subject on pages 393-394, pointing out the general northward movement of ice indicated, and referring the carriage of the boulders to floating ice of the glacial period."

"Near Princess Royal island, in Prince of Wales strait, and also on the coast of Prince of Wales island, the copper said to be picked up in large masses by the Eskimos may be supposed to be derived from the Cambrian rocks of the Coppermine River region to the south, as it is not probable that it occurs in place anywhere in the region of horizontal limestone where it is found."

"Dr. Armstrong, previously quoted, notes the occurence of granitic and other crystalline rocks, not only on the south shore of Behring land, but also on the hills inland. These, from what is known of the region, can scarcely be supposed to have come from elsewhere than the continental land to the southward."

"In an account of scientific results of the Polaris Expedition, it is stated of the west coast of Smith Sound, north of the Humboldt glacier that, wherever the locality was favourable the land is covered by drift, sometimes containing very characteristic lithological specimens, the identification of which with rocks of South Greenland was a very easily accomplished task. For instance, garnets of unusual large size were found in latitude 81o 30', having marked mineralogical characters by which the identity of some garnets from Tiskernaces was established. Drawing a conclusion from such observations, it became evident that the main line of the drift, indicating the direction of its motion, runs from south to north."

McMillan on page 460, Cruise of the Arctic 1908-09, reports: "Post-Tertiary sands are found on the shores of the Arctic islands, with certainty, up elevation of 50 feet. The few shells, collected by the writer, at an elevation of 10-20 feet, have been identified by Mr. Lambe, as those of living species. Dr. Walker, surgeon of the Fox, collected at Port Kennedy, Bellot strait, at elevations from 100 to 500 feet, specimens of Saxicava rugosa, Astarte Borealis, Mya trunkata, Cyprina, Islandica, Talima proxiana, Mya Eddevallensis, Cardium sp., Buccinum undatus, Balanus Uddevallensis. The finding of large bones at greater elevations would tend to show the existence of such deposits up to elevations of 500 feet. In this connection, mention might be made of the finding by Osborn, of the crown and shoulder bones of a whale—almost fossil—50 feet above the sea on the south shore of Harvey island; and by Belcher, of the head bones of a large whale on Mount Parker, Bere Bruce point, and an imbedded whale on Cape Disraeli, North Devon, both at about 500 feet above the sea."

"Boulders and fragments of various Archaean rocks and pieces of Silurian limestone are to be found on Melville island up to elevations of 800 feet. The evidence produced of drift boulders of North Somerset granite found at Graham Moore bay, Cape Rennell and Leopold, is not very conclusive. Following the same line, another might infer that graphic granite found at Bridport inlet. Melville island, came from Cape Warrender, where such granite is known to occur. The evidence deduced from the finding of masses of native copper in limestone areas is perhaps more conclusive. In this connection mention might be made of the finding by one of our seamen of native copper, containing crystals of calcite in the gravelly soil at Winter Harbour."

"Granted—as have been supposed by Suess—that Baffin Bay remained an unsubmerged portion of the continent until comparatively recent times, the presence of boulders and fragments of Archaean and Silurian rocks on the western Arctic islands would be amply accounted for the carrying agency of floating ice."

Post-Tertiary.—Under this division are included the various superficial deposits in which all the mollusca are still living species. It is usually divided into two series.

(1)—an older group of deposits in which many of the Mammals are extinct species to this group the names of Pleistocene, Post Pleiocene or Diluvial have been given; and

(2)—a later series, wherein the mammals are all of still living species, to which the name of Recent or Alluvial has been assigned. These subdivisions, however, are confessedly very artificial, and it is often exceedingly difficult to draw any line between them."

"In Europe and North America a tolerably sharp demarcation can usually be made between the Pliocene formation and those now described. The Crag deposits of the south-east of England show traces of a gradual lowering of the temperature during later Pliocene times. This change of climate continued to augment until at last thoroughly Arctic conditions prevailed, under which the oldest of the Post Tertiary or Pleistocene deposits were accumulated."

"It is hardly possible to arrange the deposits in a strict chronological order, because we have no means of deciding, in many cases, their relative antiquity. The following table is rather an enumeration of the more important of them than an arrangement in their exact sequence: "Recent-River Alluvia, Peat Mosses, Lake Deposits, Blown Sand, Marine Deposits, Raised Beaches.

Pleistocene or Glacial.—Moraine Stuff—Kame or Esker Series—Clyde-beds—Upper Boulder Clays—Inter glacial Beds—Lower Till—Iceworn Rock Surfaces—Preglacial Forests and Land Surface.

"Under the Glacial or Pleistocene Period the whole of the north of Europe was buried under snow and ice and the greater portion of Britain was similarly ice-covered. The existing snow-fields and glaciers of the Pyrenees, Switzerland and Norway are remnants of the great ice-sheets of the glacial period, while the arctic plants of the mountains are relics of the northern vegetation which was universal from Norway to Spain (Encyclopedia Britannica).

Economic Minerals.—Most of the economic minerals, such as coal, iron, gold, copper, and silver have been treated of elsewhere in this volume.

Coal.—Low writes: "The presence of extensive deposits of coal on the islands north of Lancaster sound has already been mentioned in the discussion of the Carboniferous and Tertiary formations of the northern islands. The Carboniferous rocks cover all the western islands of the Parry group, and extend northwesterly into the northwest part of Ellesmere. Parry first discovered coal in the cliffs at Winter harbour on Melville island, and used it for fuel on his ships. The Franklin search parties later found outcrops of coal in other places along the southern and eastern chores of that island and in the cliffs of Bathurst island.

"These outcrops of coal indicate that the seams seen in the southern cliffs will be found extending inland over the greater portion if the islands, where they are covered by several hundred feet of newer rocks. No coal has been found in the Carboniferous rocks of Ellesmere island. The mineral occurs in thin-beds along with sandstones and shales, and is a good quality of bituminous coal.

"In the folded Tertiary rocks found in the vicinity of Lady Franklin sound on the west side of Kennedy channel several outcrops of excellent bituminous coal have been discovered. The beds in the neighbourhood of Fort Conger have been mined along the outcrop and used for fuel by the Nares expedition and by Greely and Peary.

Lignite."Attention has been drawn to the occurrence of lignite of an excellent quality in the sand and clay deposits of Tertiary age along the northern and eastern shores of Baffin island and on the west side of Bylot island."

These lignites probably correspond to the bituminous coal found in the folded Tertiary rocks of the far north, and may prove to be quite extensive and of economic value, as the localities at which they have been found, although within the Arctic circle, are by no means so dangerous of access as the coal beds of the north.

"There is no doubt that the combined areas of Carboniferous and Tertiary coals are very extensive, and that they would form a valuable addition to the mineral wealth of the Dominion if they were located in a more accessible region. Situated as they are in the northern Arctic islands, where navigation is at all times uncertain and usually perilous, it is very doubtful if they will ever prove of economic value.

Iron.—Pieces of lay ironstone are abundantly distributed in carboniferous sandstone of Melville and Bathurst islands. Thin layers occur in the shale at various places. The quality is such as hardly to be considered of economic value.

Ungava Bay.—"Mention has been made" writes Low, "of the iron ores on the west shores of Ungava bay, on the north side of the Payne river. The rocks in which these ores are found have been altered by the intrusion of granites. They now consist of quartzites, mica-hornblende schist and crystalline limestone, and are the metamorphic representatives of the unaltered iron-bearing rocks of the interior of Labrador peninsula and the east coast of Hudson bay. In localities where the rocks are unaltered the iron ores occur either as carbonates in a cherty rock, or as a mixture of magnetite and haemetite intimately associated with chert and jaspar. At Payne river the iron-bearing beds have a thickness of 420 feet. The upper 70 feet is a light-yellow fine granular quartzite containing patches of ankerite and lime. Towards the top the rock shades to a dark bluish-gray, from the presence of large quantities of magnetite in small flattened grains, together with small scales of specular iron. These are usually mixed with quartz with evidence of foliation, and at other places are in large masses of nearly pure ore. Underlying these beds is 350 feet of dark-bluish slaty quartzite holding considerable magnetite and hæmatite, and shading upwards into a barren quartzite. Most of the ore of this locality would probably require separation and concentration from the admixe quartz before being of a grade sufficiently high for smelting. The position of the deposits on the west side of Ungava bay, where the tide rises and falls forty feet or more, is not very promissing for shipping."

Nastapoka.—A description has already been given in chapter XIII on Hudson Bay, of the iron deposits of the Nastapoka islands on the east side of Hudson Bay.

Molybdenite.—Flattened crystals of molybdenite have been found in many localities in the pegmatite veins penetrating the

Laurentians rocks, but in no place has the quantity been sufficient for mining.

Gypsum.—This has been reported from near Port Bowen, Batty bay, and Port Leopold in Regent inlet, and from various places to the westward, notably at Cape Colquhoun, in the north of Melville island, and near the eastern end of the Jeffries range Bathurst island, where limestone formed the upper part of the cliff at Cape Colquhoun; masses, pale blue and rose-pink in colour were found by Osborn among red and green earth resembling of copper. Near Sergent point—east coast of Bathurst—a calcareous deposit is mentioned as occuring with or amongst sandstone with overlying limestone.

Petroleum.—Pitch mount in Arthur fiord, North Devon, is described by Belcher as of whinstone formation with strong naptha and asphalt effluvium. The limestone erratics on Melville island have included so much of the gaseous products of distillation that the fetid odour was detected by Parry from the cartwhell stricking the stones. A similar odour is given off when the limestone of Browne island is broken. These observations indicate the possibility of petroleum being found in the limestones and dolomities of the central region.

Probable condition of the earth's interior.—Various theories (most fanciful) have been propounded on this subject. There are only three which merit serious consideration.—(1)— One of these supposes the planet to consist of a solid crust and a molten interior.—(2)—The second holds that, with the exception of local vesicular spaces, the globe is solid and rigid to the centre.—(3)— The third contents that, while the mass of the globe is solid, there lies a liquid substrarum beneath the crust (Encyclopedia Britannica).

Volcanœs.—The first of these theories has, apparently, the most supporters on account of the numbers of extinct and active volcanœs which are scattered over the earth's surface, which form a small proportion of the whole which have been in operation since early geological times. It has been inferred therefore that these numerous funnels of communication with the heated interior could not have existed and poured forth such a vast amount of molton rock, unless they drew their supplies from an immense internal molton nucleus. When the products of volcanic action from different of widely separated regions are compared and analysed they are found to exhibit a remarkable uniformity of character. Lavas from Vesuvius, from Hecla, from the Andes, from the Japan and from New-Zealand present such an agreement in essential particulars as, it is contented, can only be accounted for a supposition that they have all emanated from one vast common source.

Drilling Experience.—The following newspaper clipping throws some light on the question of the nature of the earth's interior:—"Pittsburg, April 27, 1914. Scientists have asserted of late that the earth's interior is not a molten mass, but rather is a solid substance with greater rigidity than steel. Practical experience with the deepest hole into the interior of the earth known to be in existence smiles and declares that a drill proves an entirely conclusion.

On the one side, advancing the claim of theorotical science are the detailed experiments of Prof. Albert A. Michelson, near the Yerkes Observatory at Lake Geneva, Wis. He declares that his test is proof conclusive that the interior of the earth is rigid, and yet of great elasticity.

On the side of practical knowledge is to be had the experience of the drillers of the famous deep well near Oakdale, this country belonging to the People's Gas Company, which has now reached a depth of nearly 6,500 feet.

The man in charge of the drilling smiles at Prof. Michelson's claim. Not only do they say that their drilling operations prove the contrary, but each day brings some new evidence to prove the fallacy of science.

Long since the immence drill, which is boring into the bowels of the earth, was attached to a steel cable, as a rope continually burned off. Even though specially constructed hard steel drills costing thousands of dollars have been made, they will only hold their point for a few minutes, the heat being so intense that they sotfen rapidly. Different kinds of mineral formations brought up by big drills also weaken Prof. Michelson's claim."

Earthquake.—The abundant earthquake shocks which affect large areas of the globe are maintained to be inexplicable unless on the supposition of the existence of a thin and somewhat flexible crust.

Age of the Earth.—Geologists vary greatly in their estimates of the age of the earth and base their theories on widely different phenomena. Dr Croll puts it at 60 million years. Sir William Thomson contents that the globe became solid some ten thousand million years ago. Professor Tait considers the possible period which can be allowed to geologists is something less than ten millions of years. In another place he places the limit of time during which the sun has been illuminating the earth, as "on the very highest computation, not more than 15 to 20 millions of years"; while in another sentence he admits that "by calculations in which there is no possibility of large error, this hypothesis is thoroughly competent to explain 100 millions of years solar radiation at present rate, perhaps more."

To the illustrious James Hutton (1785) geologists are indebted for strenuously upholding the doctrine that it is no part of the province of geology to discuss the origin of things. He taught them that in the materials from which geological evidence is to be compiled there can be found "no traces of a beginning, no prospect of an end". How the earth originated is entirely problematical and the subject of theoretical guesswork. The exterior part of the terrestrial globe is a solid crust of rock and earth, surrounded in part by a liquid envelope, or the sea, and entirely surrounded by a gaseous liquid, which is the atmosphere or air The interior of the earth is fluid and incandescent according to some, and solid (some even say of solid iron) according to a greater number. The solid crust is composed mainly of rock, and is estimated to be some thirty miles thick, while that of the atmosphere is estimated at 100 miles. Miners have descended some 5000 feet nearly a mile below the earth's surface, and a small perforation has been made as far as 7350 feet in depth. It has been observed that, when descending the mines, the heat increased one degree Fahrenheit, every 55 deep of descent. The circumference of the earth is 24,902 miles or 40,000 kilometres; the polar diameter, 7,899.58 miles; equatorial diameter, 7,926,59 miles.

"The oldest rocks which have been discovered in any part of the globe have practically been derived from other rocks older than themselves. Geology by itself has not yet revealed, and is little likely ever to reveal a trace of the first solid crust of our globe. Geological history is compiled from direct evidence furnished by the rocks of the earth, it begins at the beginning of things, but must be content to date its first chapter from the earliest period of which any record has been preserved among the rocks."

"Nevertheless astronomy, physics and chemistry have in late years all contributed to cast much light on the earlier stages of the earth's existence, previous to the beginning of what is commonly regarded as geological history. Geology is no longer content to begin its annals with the records of the oldest rocks, but is grouping its way through the ages which preceded the formation of any rocks. Thanks to the results achieved with the telescope, the spectroscope, and the chemical laboratory, the story of those earliest ages of our earth is every year becoming more definite and intelligible." (Encyclopedia Britannica 1879 Ninth Edition.)

CHAPTER XV

Air Temperatures—Seasons—Wind and Weather—Ice—Magnetic Pole and Variations—Navigation—Sledge Notes—Arctic Outfit—Rules of the Road at Sea—The Compass and Sextant—Arctic Terns —Values of Degrees of Longitude

AIR TEMPERATURES AT POND'S INLET 1912-13. FAHRENHEIT.

Month	Av. Temperature	Highest	Lowest	Seasons
September	+30°	+36°	+26°	
October	+27°	+34°	+80°	Winter
November	—18°	+22°	—40°	
December	—28°	— 8°	—42°	
January	—32°	—10°	—50°	
February	—34°	+30°	—47°	Winter
March	—41°	— 9°	—52°	
April	—19°	+18°	—36°	
May	+16°	+30°	—10°	
June	+30.50°	+44°	+60°	Spring
July	+36°	+50°	+27°	
August	+32.50°	+40°	+28°	Su mmer
Av. for 12 months	0° (zero)	+21-	—15°	

The temperature of the air falls below Freezing Point (32° Fahr) about September 15th., when young ice forms on the fresh water lakes and slush ice on the sounds; the temperature of the sea-water at the surface is then —29 to 31° Fahr. The atmosphere falls below zero about the middle of November; and dœs not rise above Freezing Point (32° Fahr) until about June 21st. The greatest range of the thermometer during the year is roughly 110° Fahr. from 55° below zero in January, February and March to 55° above zero (in the shade) in June and July.

The average temperature for the Winter months—November to April inclusive—was—25½- Fahn.

ANALYSIS OF WIND AND WEATHER 1912-13 AT SALMON RIVER ECLIPSE SOUND.
(*Lat.* 72o 30′ N)

Wind.—The wind blew from a westerly direction 209 days of the year; being the prevailing wind for every month in the year.

The wind blew from an easterly direction 71 days in the year; most frequently in the months of June, July, August, September and October. Fifty eight days were calm, for an aggregate of a week in each of the months of September, October (9 days), November, May (5 days), June, July and August.

Gales.—There were fifteen gales during the year; September (one), January (three), May (two), June (six), July (three).

Snow.—It snowed during forty-eithg days in the year. September (six days), October (8 days), November (8 days), December (1 day), January (1 day), February (3 days), March (2 days), April (2 days), May (9 days), June (4 days), July (2 days), August (2 days).

Rain.—Heavy rain fell 25 days in the year; June (4 days), July (8 days), August (8 days), and September (5 days).

Fog.—Fifty-one days were foggy; September (2 days), October (4), November (9), December (7), January (2), February (5), March (2), April (7), May (8), June (2), July (1), and August (2).

Sun.—The sun did not rise and was invisible for 86 days from November 9th., to February 3rd.

The sun did not set and was visible day and night for 65 days from May 21st. to July 25th.

Ice.—Ice forms on freshwater lakes by September 15th and the ice frozen in at Albert Harbour on October 5th, 4½ inches thick, on October 9th, strong enough to bear a man's weight. On October 15th sledging begins. Maximum thickness of ice outside of harbour in April 1906, 65 inches. The Arctic was ranging at her berth on June 29th. On July 13th the ice was bad and on July 20th broke in Albert harbour and was moving with the tide. On July 27th 1906 the Arctic specially constructed for ice, left Albert Harbour for sea and took two days to force her way out through the heavy ice-pans to sea; and met the whalers, Eclipse and Morning, working their way in from the south. The schooner Minnie Maud was free from ice in the harbour on August 8th and was able to leave Albert Harbour on August 12th. Although she actually left on August 25th when Eclipse Sound was clear of ice-pans. Ice sledging ceases on July 14th when the ice on the sound is rotten, thin, full of holes, cracked and broken by winds and tides.

MAGNETIC POLE AND VARIATIONS

LOCATION OF MAGNETIC POLE

Magnetic Pole—(Ross 1831). Lat. 70o 5′ 17″, Long. 96o 56′ 45′ W.

DESCRIPTION OF MAGNETIC POLE

The Northern Magnetic Pole was for the first time in history located by Lieutenant Commander James Clark Ross the active and indefatigable nephew of Sir John Ross, on June 1st. 1831; in latitude 70o 5′ 17″, longitude 96o 46′ 45″ West—dip of the needle 89o 59′ within one minute of the vertical. The proximity of the magnetic pole was further established by the total inaction of the several horizontal needles in Ross' possession; not one of which showed the slightest effort, although delicately suspended, to move from the position in which it was placed. They hoisted the British Flag on the spot and took possession of the North Magnetic Pole with all adjacent territory in the name of Great Britain and King William, the Fourth; and erected a large cairn of limestone boulders marking the spot, under which was placed a canister with a record of the discovery.

Lieut. Commander Ross in his report wrote: "The land at this place is very low near the coast, but it rises into ridges of fifty or sixty feet high about a mile inland. We could have wished that a place so important had possessed more of mark or note. It was scarcely censurable to regret that there was not a mountain to indicate a spot to which so much of interest must ever be attached and I could even have pardoned any one among us who had been so romantic or absurd as to expect that the magnetic pole was an object as conspicuous and mysterious as the fabled mountain of Sinbad, that it even was a mountain of iron, or a magnet as large as Mont Blanc. But nature had here erected no monument to denote the spot which she had chosen as the centre of one of her great and dark powers. We were fortunate in here finding some huts of Esquimaux that had not long been abandoned and were enabled within their shelter to establish our observations with the greater ease."

MAGNETIC VARIATIONS — NAVIGATION.

MAGNETIC VARIATIONS OF COMPASS.

PLACES	Magnetic Variation
Ashe Inlet-Hudson Straits	+52°31′4″W.
Albert Harbour-North Baffin Land	+93°W.
Blacklead Island-Cumberland Gulf	+60°4′9″W.
Belle Isle	34° W.
Browne island, Cornwallis Island	—149°57′9″W.
Cape Bounty, Melville Island	—107°8′4″E.
Cape Fisher—Winter Island	—145°58′5″E.

Cape Fisher—Winter Island	—56°18′W. Dip 87° 49′33″.
Cape Hotspur, Bathurst island	—145°58′5″ E..
Cape Welsford—Southampton island	—50° 18′ W.
Cape York, Greenland	+29° 18′ 6 W.
Chesterfield Inlet (S. Entrance)	+10°W.
Dealy Island, Melville Island	—106°35′E.
Disko Island, Greenland. Godhaven	+62° 32′ 2 W.
Erebus Bay, North Devon	+123°75′W. (approx).
Gibson Cove—Repulse Bay	—48°33′W. Dip 88–07½′.
Igloolik, Fury & Hecla Strait (Parry 1823)	+82° 39′ 54″ W.
Fox Channel—Lat 65–7′ N; Long. 79–28′W	Mag var. 52°11¾′W.
Igloolik	82°39′54″W. Dip 88°55″.
Fullerton Harbour, Hudson Bay	+18° W.
North End—Neertonatko island	—87° 20′ W.
Point Gillman, Byam Martin Island	—128°45′4″E.
Point Griffiths, Melville Island	—120°18′1″E.
Port Burwell, Hudson Strait	+44°1′3″W.
Port Churchill. Hudson Bay	2° E.
Port Leopold, North Somerset	+120° W. (approx).
River Clyde, East Baffin Coast	+75°19′4″W.
Salmon River, Eclipse Sound	+96°W. (approx).
West End—Amherst island (Fury & Hecla strait)	—89°18½′W.
Tern Island	82° 22′W. Dip 87–37′.
Winter Harbour, Melville Island	—97°17′6″E.

MAGNETIC VARIATIONS

From observations taken by C. P. L. "Arctic" in 1907-08; A. P. Low in "Neptune" in 1903-04; and by C. C. Craft, of the U. S. Department of Terratial Magnetisme in 1908.

PLACES	Magnetic Variations
Godhaven (Disko Island)	+ 62°32′.2 W.
Hare Island (Greenland)	+ 63°15′.3 W.
Upernivik (Greeland)	+ 69°30′W.
Cape York (Greenland)	+ 79°18′.6 W.
North Star Bay (Greenland)	+ 89°55′.1 W.
Kangerdlooksoah (Greenland)	+ 92°07′.9 W.
Etah (Greenland)	+104°04′.2 W.
Hawk Harbour (Labrador)	+ 39°57′.0 W.
Battle Harbour (Labrador)	+ 35°05′.8 W.
Flœberg Beach (near Cape Sheridan)	97°57′W.
Port Foulke (near Etah)	110°36′8. W.
Port Foulke (near Etah)	110° W.
Folk Conger (Lady Franklin Sound)	100°36.8′W.

Navigation.—North of the Arctic Circle the ship's compass becomes very sluggish and unreliable, owing to the proximity of the Magnetic Pole. The ship's position must be ascertained daily when the atmosphere is not abscured by fog and clouds, from the sun at noon for latitude and by the ship's chronometer for longitude; and the day's run checked by the log's with allowance made for favorable and contrary currents. Bearings are laid from the land where possible, and in the long hours of daylight, in the summer months it is often expedient to set the course from one iceberg to another. When near the land, soundings should be taken and a constant look-out kept for tides ripples or shoals, low islands and reefs. In times of fog, mist and the dark hours of night, especially in stormy weather, wherever icebergs are likely to be met with, the ship should slow down to half or quarter speed or heave to until daylight appears. Ice at a distance can be distinguished from land by the whitish glare or "glint" which it throws up from the surface of the water, while the land always appears dark unless it be very low-lying and thickly covered with snow.

NAVIGATION — SLEDGE NOTES

Leads.—No "leads" or open lanes of water between the heavy ice-floes should be entered by a ship unless a way out again is seen. Many ships have been lost through neglect of this precaution; amongst others, the "Algerine" in Ponds Inlet and the "Proteus" in Smith Sound and many others. No ship is strong enough to withstand the pressure of two huge floes, often square miles in area, that are crushed together by wind and tide. It sometimes happens that the large icebergs, impelled by wind and current, will plough their way through the icefields, which they break up, causing "leads" through which a ship may follow or go in the opposite direction.

Ice Navigation.—Parry when navigating Fox Channel to the north-east of Southampton Island in August 1821, writes: "At this time the prospect to the westward offered from the crow's nest as unpromising, on account of the closeness and extent of the ice, as I ever remember to have seen it. Shortly afterwards, however, the ice, gradually, or rather suddenly, became navigable in that direction, the ice separating and, in fact, disappearing in so rapid and extraordinary a manner as to astonish even those amongst us who had been the longest accustomed to this navigation, and affording a striking example of those sudden changes which in icy seas, almost teach us never to despair of making progress, even under circumstances apparently the most unfavorable. We did not fail to take advantage of this alteration, and under all sail soon made Southampton island after an unobstructed run of between thirty of forty miles, when we were again stopped by the heavy and extensive floes."

Dismantling Ship.—Parry remarks: "It may indeed, be safely affirmed that in a high latitude the less the masts and yards are dismantled the better, for the frost does no injury to the gear while it remains unmoved; and none can possibly occur from thawing till the proper season for refitting arrives."

SLEDGE NOTES

For seldge travel in the Arctic, the only correct and reliable bearings are the sun's true bearings, as the compass is very unreliable and is not used in fine weather. The magnetic variation of the compass also varies from year to year. which makes navigation by that means, on sea and land, very unreliable. Parry found the magnetic variation at Winter Harbour, Melville Island, in 1819-20 to be 127 degrees easterly; while the "Arctic" in 1908-09 found it to be 98 degrees easterly a difference of 29 degrees.

The officers of the Arctic, when preparing for their sledge journey across Mc Clure Strait, from Melville Island to Banks land took beforehand the sun's bearings on the 74th., and 75th. parallels for use in April and May. Each officer was provided with a pocket card on which was marked the sun's bearings every 20 minutes for the 24 hours during the long days when the sun did not set. In the dark winter months when the sun is low, the moon shines with great brilliance for about ten days in each month, and the natives take advantage of these moonlit days and nights to travel from place to place and to visit their traps. The "Arctic" officers also prepared a chart showing the bearings of the moon for each day and night of the month, and prepared a table for their guidance when traveling at night. This table was found of great service when crossing the wide strait when the land was not visible.

With regard to the comparative value of dog-power and man-power for hawling sleighs, the commander of the "Arctic" reported: "I regret that dogs were not available for drawing the sleds. Our explorations and traveling would have been accomplished in much less time and more territory covered, and, in consequence, a more extensive field examined by the scientific officers and less hardship endured by the men on the expedition to Banks island, if dogs had been available. Travelling is extremely slow and hard for men who draw their own supplies over snow that would not bear the weight of the men. The reports of the officers sent to Banks island show the extremely arduous work performed by them on their trips across Mc Clure strait, where hummocks of ice and deep snow impeded their progress. They also show that the exposure to extreme cold and high winds, which swept the unprotected strait, was prolonged by the necessity of drawing their own supplies and equipment. I, therefore, advise the precaution of providing dogs in similar expeditions".

Arctic Outfit

The following is a list of selected articles that will serve as a guide to sportsmen, explorers, and prospectors who contemplate spending a season or more in the Arctic.

Every article should be of the best quality and as compact and light as possible. Provisions wherever possible, should be packed in hermetically sealed tins of moderate dimensions for sledge transport, and the rifle should be carried in a very strong box to stand every sled accidents, for the sledges often turn upside down in bad ice. This box should be in a handy place so to be always in position to catch at a glance the rifle.

ARCTIC EQUIPMENT

For purposes of trading and the hiring of Eskimos, dogs and sledges, a sufficient supply of arms and ammunition (43 Mauser, Martin-Henry, 303 British, 303 Winchester, 450 Express, 57 Snider and 44 Winchester in proportion to the foregoing order) and of Smoking and Chewing Plug Tobaccos, Matches, Hatchets, Skinning and Snow Knives saws knives handsaws, Pocket Knives, Files, Needles (assorted), Beads, etc., should be included in the equipment, small sets of tools and traps No 1½ "Victor" and few No 4.

The equipment may be classified under the headings of: Instruments, Arms, Clothing, Provisions, Kitchen, Transport, Sundry and Medical and Pastimes.

Instrument.—Compass, Sextant, Chronometer, Watch, Pedometer, Artificial Horizons and Mercury, Telescope, Binoculars, Photographic Camera or Kodak and Moving Picture Kodak and necessaries to finish those pictures.

Compass.—Kraemar's Pathfinder is a suitable instrument.

Telescope.—The Bardou Extreme High Power Telescope with a magnifying power of 47 times is about the best instrument for all purposes, terrestrial and astronimical—25 in., closed 30¾ in., extended. Weight 4 lbs. Or any other better, the very best and compact.

Binoculars.—The Busch 10 Power Terlux Army and Navy Model, specially designed to stand rough usage, adopted by U. S. Army and Navy is probably the best combination for Power, Definition and Illumination. Field of view at 1000 yards, 80 yards Diameter of object lense 1¾ in.—Height 7¾ in. Weight 7¾ lbs. The best Range-Finder, to take the longest distance you can, the more compact instrument.

Note.—These instruments can be obtained from any well known dealer in sporting goods.

Franklin's Instruments.—Franklin, on his continental expedition to the Polar Ocean by way of the MacKenzie river in 1825 included the following instruments in his equipment: "In the choice of astronomical instruments I was necessarily guided by their portability. Our stock consisted of two small sextants, two artificial horizons, two altitude instruments, a repeating circle or lunar observations, and a small transit telescope for ascertaining the rates of the chronometers. We had a dipping-needle mounted on Meyer's plan, a plain needle very delicately fitted for observing the diurnal variation; two of Kater's azimuth compasses, and a pocket compass for each officer. The atmospherical instruments were two electrometers, two of Daniel's hygrometers, Leslie's photometer and hygrometer, besides a supply of mercurial and spirit thermometers of different sizes."

Arms, Rifle.—The 280 High Velocity Sporting Ross Rifle is the best all round rifle for big game of any description. The Ross 280 has proved its efficiency and dropping-power on polar bears, musk-ox, caribou, walrus, narwhal and seal in the Arctic; on elephants, lions, tigers, rhinoceros andbisons in Africa and India; on grizzlies, mountaingoats, elks and moose in theRockies of America. It has the flattest trajectory of any rifle made, 4¼ in., rise in 300 yards and 9 feet in 1000 yards as against the U. S. Springfield's 14 feet at the latter range. It has a muzzle velocity of 3050 feet seconds and its 145 grain bullet strikes a ton and a half blow. The straight-pull bolt action is the simplest, strongest and quickest made-five shots in two seconds-and it does not jam in the coldest weather. Weight 7½ lbs. The Ross Copper Tube Bullet is the most deadly in use and is the best for bear, musk-ox, caribou and seal. The all metal cased bullets are most suitable for piercing the tough, heavy bones of walrus and narwhals also the Newton Rifle Caliber, 256, 30 and 35, are the two best Rifles for any largest game in the world and the cartridges can be loaded with reduced charges for small game with the best accuracy, I recommend these Rifles for explorers, prospectors, hunters, sportmen, and tourists.

Combination Rifle and Shotgun—A very useful arm for the Arctic for large and small game is the "Mixed Expres" made by the Manufacture Française d'Armes et Cycles of Saint Etienne, France. It combines a pair of 405 (10.5 m m) Express rifles with a 12 or 16 bore shot gun underneath. Weight 8 lbs.

Marble's Game Getter Gun.—12 in., barrel is a handey little weapon for small game, hares, ducks geese and ptarmigan, or even for caribou, and seal at close range. It has a very accurate 22 rifle barrel on top with a 44 smooth bore, for shot or ball cartridge, underneath. The stock folds up and the arm is carried in a shoulder holster. Weight 2¾ lbs.

Pistol.—The most powerful and reliable pistol in the world is the Colt. 45 Caliber Automatic Pistol 7 shots-as adopted by the U. S. Army; and can be relied on to drop the largest game, including bear and walrus, at short range. Weight 39 oz.

CLOTHING

Winter.—The best clothing in the Arctic in wintertime, when the thermometer ranges steadily from November to June between 10o and 60o below zero, is made by the Eskimo women from the skin of caribou, polar bear, fox, hare and seal. A good combination is heavy, all-wool shirts, button sweater with pockets, drawers and socks underneath with Eskimo skin clothing consisting of Koolitang, trousers, socks, shoes and mittens outside. A warm-lined leather cap with ears-and-neck-flaps; several pairs of inside woolen mitts trigger-finger; a fur or wool-lined leather face-mask to cover the nose and cheeks but leaving the eyes, nostrils and mouth free; snow-goggles with wooden or felt covered metal rims; several pairs of thick felt insoles to put inside the Eskimo shoes as a protection against the frost; and a pair of snowshoes complete the winter equipment.

The wooleen-socks should be of different sizes so that two or three pairs can be worn at the same time. Ordinary stiff leather boots are useless in the Arctic in winter and will freeze the feet in short order. The Eskimo boots should be made long and large enough to cover a thick felt insole, a thick pair of wooleen socks, a caribou-or hare lined Eskimo sock (hair inside), a caribou or seal over-sock with long caribou legs to the knee. The socks and inside mittens (wool or fur) should be changed or dried every night as otherwise the perspiration soon freezes the feet and hands.

Summer.—In summer time wooleen under-clothing; ordinary rough outer clothes; a button sweater jacket with pockets; a sheep lined coat; high leather water-proof mocasin boots with soles and heels (the latter steel-studded)or Eskimo Big Seal (oogjook) boots; wool-lined leather mitts with trigger finger; a light hunting cap with flaps; rain coat, and rubber thigh boots for wading and fishing.

PROVISIONS

(For the Base of Permanent Camp.)

Fresh meat of seal, seal liver, walrus, caribou, hare, ptarmigan, bear and musk-ox are obtainable from the Eskimos or by hunting.

In summer salmon, trout, geese and ducks are obtainable.

A selection can be made from the following:

Bacon (slabs).—Salt Pork, Canned Beef, Sausages, Bologna, Pork and Beef in tins.

Dried fish.—Salmons and Sardines in tins.

Biscuits.—Hard tack or ship's biscuits, four to the pound packed, 120 in a sealed tin.

Beans, Peas.—Rice, Oatmeal, Wheat Flour in tin, Corn Meal, Baking Powder (1 lb to 100 lbs. Flour) and Yeast cakes for making Sourdough bread and pancakes.

Sugar, Molasses (syrup), Tea, Coffee, Cocoa, Sweet Chocolate, Milk Powder, Condensed Milk, Tinned Butter, Eggs, Cheese Powder, Lard, Salt, Pepper, Mustard, Curry and Onion Powder Raisins.

Debydrated Vegetables.—Potatoes, Onions, Carrots, Sweet Corn, Green Peas, Spinach, Horse Radish, Sliced Beans, Asparagus. One pound of dehydrated potatoes will make seven pounds of fresh, and one pound of dehydrated spinach will make 19 lbs of fresh spinach.

Dried Vegetables and Fruits.—Onions, Potatoes, Spinach, Turnips, Apricots, Rhubarb, Peaches, Apples, Prunes, Dried apricots are especially recommended as a preventive of scurvy.

Pemmican, Bovril, Tabloid or Compressed Tea, soup tablets (pea-bean), barley, tomato, onion, mulligatanny, rice and mock turtle, consommé tablets and Erbswurst.

Pickles.—(1 quart per man per month), Limejuice and Vinegar.

Alcohol.—No alcohol is required as a stimulant in the Arctic—Tea, Coffee and hot Soup are better. A case of Liquor Brandy might be included as medecine in case of cramps, colic or dysentery.

Pemmican.—Is a prepared and condensed food, made from beef fat and dried fruits. Peary, who should be the best authority on the subject, describes it as the most concentrated and satisfying of all meat-foods and as absolutely indispensable in protracted Arctic sledge journeys. A bullock dressing 698 pounds of beef and bone yields 47 lbs of first-class pemmican, 47 pounds of second-class pemmican and 23 pounds of dried meat, including tongues, a total of 117 pounds, dried. The total nutritive strength is thus reduced in weight to one sixth that of the fresh beef.

Erbswurst.—Soup Rolls form the standard concentrated food used in the armies in Europe. They contain more nourishment for their weight and bulk than any other emergency ration. Erbswurst is compounded of pea, bean or lentil meat, meat and vegetables, well seasoned with pepper and salt. It is in the form of a powder and is dropped into boiling water to make a thick soup or gruel in a few minutes. It is made up in ¼ lb., and ½ lb., rolls and ⅛ lb. will make two big helpings.

Sledge ration in the Field.—Peary found the best ration for sledge journey in the Arctic to be, one pound Pemmican, one pound Ship's Biscuits, half oz., compressed Tea, 6 oz Kerozene or Alcohol for fuel a total of 2 lbs. 4½ oz. of solids per man. To this might be added an alternative diet including Erbswurst and Chocolate.

The "Arctic" ration for sledge expeditions consisted of: Pemmican, 1 lb., Biscuit ¾ lb., Chocolate 1½ oz., Sugar ¼oz., Tea ¼ oz., Sugar for Cooking ½oz., Potatoes 2 oz., Tobacco ½ oz., Curry and onions; Pepper and salt for soup 2 lbs ½ oz. per man.
Tobacco.—Smoking and Chewing, and Matches. Couple of waterproof boxes at least for each man. All matches should be carried in water and fireproof boxes.

KITCHEN

For the permanent camp a coal and wood stove with an oven for baking is the best, as it also warms the dwelling. In addition to the regular set of boilers, fry-pans and kettles, a good cereal steam-boiler should be included for cooking porridge and cornmeal and for making steamed sourdough bread. For boiling and frying and for use in tent and igloo Kerosene and Alcohol stoves are the best; as the gasoline stove is not satisfactory in the Arctic as if, constantly getting out of order and the even present danger of an explosion and fire. The 4 inch double-wick burner is probably the most useful size for a Kerosene stove.

TRAVELLING KITCHEN

The "Kitchen box" as designed by Peary for his sledge journeys to the North Pole is simply a wooden box containing two double burner oil stoves with four inch wicks. The two cooking pots are the bottoms of five gallon Kerosene tins, fitted with covers. When packed they are turned bottom side up over each stove and the hinged cover of the wooden box is closed. On reaching camp, wheter tent or snow igloo, the kitchen box is set down inside, the hinged top of the box is turned up and keeps the heat from melting the wall of the igloo or burning the tent. The hinged front of the box is turned down and forms a table. The two cooking pots are filled with pounded ice and put on the stoves; when the ice melts one pot is used for tea, and the other may be used to warm beans, or to boil meat.

TRANSPORT

Sledge.—The best sledge for all round Arctic work, capable of standing the roughest usage when travelling over hummucky ice, pressure ridges, ice-cracks and deep holes, crusted snow and water covered ice is one made of hardwood throughout (well seasoned oak for preference), and is 14 feet long, 3 feet wide and the runners, one foot high. The runners are solid, 14 feet long, 3 inches wide and shod with 3-16 inch steel shoeing bending over to reinforce the bow for a couple of feet. The bow and stern are curved and only about eight feet, in the centre, of the runners are straight and rest plumb on the ground, so as to make the sledge easy to guide and turn as on a pivot. The bow is curved up 18 inches from the ground and both bow and stern are braced with inner and outer galvanized plates to stand heavy shocks. The runners are braced together, at bow and stern, by strong galvanized iron cross bars. The runners are two feet apart inside and the cross pieces project 3 inches on each side of the runners and are notched at the ends to catch the sled lashings. The cross pieces are of hardwood, 13 centre ones, two inches apart and 3 feet by 6 inches by one inch. The bow and stern cross boards are one foot wide, three feet long and 2 inches thick. All the cross boards are lashed to the runners with galvanized steel strand wire.

The upstanders at the stern are 2 feet long, 3 inches thick and 8 inches wide at the base; they are bolted or clamped to the runners. The drag-chain or bridle consists of galvanized chain links with ring, attached to the inside of the runners by galvanized steel plates and bolts under the bow board about seven inches from the ground.

This sledge which will not weigh over 250 lbs and will carry a load of 1500 lbs., should not cost more than $15.00. It can be drawn by a team of ten or 12 dogs.

Sledging Outfit.—Party consisting of 1 white man, 1 Eskimo and his wife, the following equipment, for 60 days hunting, exploring or prospecting trip, can be packed on the above described sledge.

30 days Dog Pemmican (red tins)	360	pounds.
60 days Men Pemmican (Blue tins)	180	”
Ship's Biscuits	180	“
Condensed Milk	40	”
Compressed Tea	5	”
Liquid Fuel-Kerosene or Alchool	40	”
Tobacco	15	”
Tent, Pole and Steel Stakes	30	”
Rifles and Ammunition Harpoon		”
Pick-axe saw, saw-knife	150	”
Spare boots and clothes	20	”
Bedding	50	”
Stove and Cookery	20	”
	1090	pounds
1 Seal	150	”
Total load	1240	pounds
Weight of sledge	250	”
	1490	pounds

The sledge should be packed as low down as possible to keep the centre of gravity low to prevent overturning; and the load should be covered with waterproof sleigh covers to keep the bedding etc., from being wet by rain and snow. Twelve dogs will pull this load, which will become lighter by about 20 lbs every day. The dogs and men will feed part of the time, on seal, caribou and bear meat when killed, and the pemmican held in reserve for occasions when the weather is too bad for hunting and game is scarce.

Peary's Sledge.—The Peary sledge was twelve to thirteen feet in length, two feet in width, and seven inches in height; the runners curved at both ends, in front and behind, with two inch wide bent ash runners attachers, and the runners being shod with two inch wide steel shoes. The sides of both runners are solid and lashed together with sealskin thongs. Two strong upstanders of wood are attached at the rear end, with a cross bar, for guiding the sledge. On a level surface this sledge will support ten or twelve hundred pounds. The dogs are attached to the sledge fanwise, as is the Eskimo custom; and the standard team is eight dogs; although for rapid travelling with a heavy load, ten or twelve are often used.

Dog harness.—For dog harness Peary adopted the Eskimo pattern, consisting of two loops joined by a cross strip at the back of the neck and under the throat, made of special webbing or belting; about two and a half inches in width, with a braided-linen sash cord for a trace. The dog's forelegs pass through the loops, and the ends are joined over the small of the back, where the trace is attached. This harness is very simple and flexible and has the advantage over seakskin that the dogs won't eat it when hungry in camp. In the Northwest dogs are harnassed tandem. This is the white man's method. In the Arctic they are harnassed fan fashion the Eskimo method. That is to say, each dog has an individul trace secured to the end of a single thong, leading out from the bow of the Kamutik (sledge) and called the bridle. The individual traces are various lengths. The dog with the longest trace is the leader of the pack, and particularly trained to respond to the drivers directions. The other dogs will follow his lead. For open country and sea-ice travel the Eskimo method is probably the best, as the work is more even distributed and the driver can always tell if each dog is doing his share of the work, but for narrow trails and wood travel the tandem method is more practicable.

Load.—Peary's sledges were loaded as follows: On the bottom was a layer of dog pemmican in red tins, covering the entire length and width of the sledge; on this were two tins of biscuits, and crew pemmican in blue tins; then the tins of alcohol and condensed milk, a small skin rug for the man to sleep on at night in the igloo, snowshoes and spare foot gear, a pick-axe and a saw-knife for cutting snow-blocks and a few extra pairs of Eskimo sealskin boots. An alcohol stove, specially designed by Peary completed the outfit.

Compactness was the main idea and keeping the centre of gravity as low as possible in order to prevent the sledges from overturning.

Sled Driving.—The dogs are guided by the whips and the voice. It takes considerable time and practice for a white man to master the use of the long whip and to learn how to control the dogs, and to acquire the exact Eskimo accent to the words: "Ar-ree, Ar-ree" meaning to the right; and "Arkai, Ar-kai" to the left; as well as the "Huk, huk, huk" which is the equivalent of "go on"—"Shoo-oo" means to "stop". When the sledge is stopped, if loaded, the runners are blocked with tramped snow; and if unloaded, it is overturned, to prevent the dogs from running away after seal and other animals that they may scent afar off.

Sledge equipement.—A couple of saw backed snow knives; a strong hatchet; a pick axe; short handled snow shovel; water proofed canvas sled covers; water proofed canvas duffle bag for clothes, etc; two 50-foot twisted fibre Hemp Lariats for rescue work and for tent guys; bamboo ice walking-stick; long light strong pole; Eskimo stove; travelling kitchen and kerozene or alcohol stove; oil cans fitted with spout and screw-top fitted with liquid fuel; compact canteen equipment containing a few plates knives, forks, spoons and cups; a couple of butcher's skinning knives with sharpening steel; a strong pair of snow-shoes; a small combination tool set; harpoon; Thermos bottle for keeping tea and bovril hot on the march; a good telescope; pedometer; watch; compass; rifle and ammunition and a plentiful supply of matches. A dozen fox-straps it can also be added an "Acme" Collapsible Canvas Boat, for crossing rivers and small lakes in summer can be added with advantage.

Tent.—For summer work the lightest and easiest erected tent is the "Miners" or "Yellowstone" Tent, which is square shaped and has the advantage of being easily and quickly set up, easily rolled for transporting and the sharp pitch of the roof and sides sheds rain and snow. It is made of heavy, white double-filled 10 oz., duck, woven double and twisted both ways. The flooring, which is made of extra heavy duck, is permanently attached to the tent, a five inch sill keeps out the dirt and rodents, and the doors or flaps are fastened by snap-hooks, making it easy to open and close.

For winter use a similar tent made of caribou or goat skins with the hair outside would make a warm and snow proof shelter. with the door flap away from the wind. In this case the bottom should be omitted and the snow floor covered with seal and caribou skins. A rope or cord could be attached to the top of the pole and attached to heavy ice or snow-blocks to windward and leeward, so as to hold the tent down in a strong wind; and snow-blocks could be packed around the edges to keep out the wind.

Sleeping bag.—The best low temperature sleeping bag for arctic use is one of caribou skins, made by the Eskimo women with the hair inside. Under ordinary conditions, however a water-proofed canvas bag lined with a detachable feather-filled bag; or a bag lined with four thicknesses of Lhama and duffle (that is, four thicknesses over and four beneath the sleeper), should not weigh more than ten pounds and afford good night covering. Woollen blankets are too heavy and became sodden with snow and frozen in the Arctic.

The best combination would be a heavy waterproofed canvas cover with a flap over the top to exclude wind and rain, weight about 6 lbs and that will absolutely keep out water; and an inner bag of caribou skin with the hair inside; or feather quilting which is very light and warm, or young musk-ox skin with the wool and hair inside. Each bag should open for a couple of feet from the top down and shut with snap kooks in order to facilitate getting in and out. A light circular stiffish pillow should also be included.

Sundry

Combination Tool Set; Thermometer (outside); Hunting kinfe; Hatchet; Butcher and Skinning Knives; Sharpening Steel; Whetstone; Pocket Knives; Vacuum Bottles; Waterproof and Fireproof Match box; Fox Traps; Canvas Game Bag with shoulder-strap; canvas-duffle-bags for clothing; drawing instruments and stationary; mirror; scissors for hair clipping; soap and towels; pocket drinking cup; lantern; leather belts; insect powder; prospector's pick and magnifying glass "Arbalette" or Cross-bow for spearing salmon from the river bank as sold by the manufacture Française d'Armes et Cycles of Saint-Etienne, France and Harpoon, thread, buttons and needles.

Medical

Medecine Chest containing: Catgut and needles, Bandages and Cotton; Quinine; Astringent (Tannic acid); Gauze; Plaster, surgical liniment; Sticking Plaster; Electric Tape; Listerine; Permanganate of Potash; Carbolic Acid Tablets; Mustard Plasters; Linseed Meal for Poultices; Spirits of Camphor; Camphorated Vaseline; Boracic Acid Tablets; Dusting Powder; Hydrogen Peroxide; Anti-phlogistin; Cathartic Pills; Ipecacuanha; Liniment; Oiled Silk; Lint; Oil of Eucalyptus; Oil of Cloves for toothache; Dental forceps; Pile remedy; Camphor Cream; Peroxide Cream; Mercurial Ointment; Bi-Chloride of Mercury; Scissors etc. And a book of direcctions as provided by Burroughes, Wellcome & Co or other responsible druggists.

Pastimes

For the long sunless winter months spent in camp, games and pastimes are necessary to keep men in good health and spirits. The days can be employed in going the round of the fox-traps and the evenings spent in recreation. Chess and draughts (Checkers); playing cards; gramophone with some lively reels and dance records to amuse the Eskimos; and a supply of books of travel and sport and illustrated magazines and catalogues will contribute to the general comfort and amusement.

The Mariner's Compass

The Mariner's Compass.—The earliest reference to the Compass are to be found in Chinese History in the 64th year of the reign of Ho-ang-ti (2634 B. C.) The power of the loadstone to communicate polarity to iron is explicitly mentioned for the first time in a Chinese dictionary, finished in 121 A. D., when the loadstone is defined as "a stone with which an attraction can be given to the needle."

It is uncertain when the compass was first used by Western nations. Its introduction into Europe has been attributed to Flavio Gioia, about the year 1307. Encouraged by the possession of this sure guide, by which at all times and in all placs he could with certainty steer his course, the navigator gradually abandoned the method of sailing along the shore and boldly committed his bark to the open sea and thereafter navigation made rapid progress.

Apart from the earlier Norwegian navigators of the ninth century, the first navigator to undertake serious voyages for the benefit of geographical knowledge and discovery was Prince Henry of Portugal, surnamed the Navigator and younger son of King Joao of Portugal and Queen Philippa of Lancaster, the grandchild of King Edward III of England; so that the first navigator was half British by descent. Prince Henry was born on March 4,1394 and when grown to manhood sailed round the north-west coast of Africa, past Cape Bojador, which he named and he also visited and discovered Madeira, the Cape Verde islands and the coasts of Senegal and Gambia.

In Mr William Barlowe's "Navigators Supply", published in 1597 we read: "Some few yeeres since, it so fell out that I had several conferences with two East Indians, which were brought to England by Master Cavendish (Thomas Cavendish) and had learned our language: The one of them was of Mamillia (Manila) in the Isle of Luzon, the other of Miaco in Japan. I questioned with them concerning their shipping and manner of sayling. They described all things farre different from ours, and showed that in steade of our Compass, they use a magneticall needle of six inches long, and longer, upon a pinne in a dish of white China earth filled with water: In the bottome whereof they have two crosse lines, for the foure principall windes; the rest of the divisions being reserved to the skill of their Pilots."

The Sextant.—The sextant is an instrument for measuring angles (latitudes) on the celestial sphere, and is furnished with a graduated *arc*, equal to one-sixth of the circle. It was originally introduced about the year 1570 by the illustrious Swedish astronomer, Tyco Brahe, who constructed several sextants with two sights, one on a fixed, the other on a movable radius, which the observer pointed to the two objects of which the angular distance was to be measured.

Hooke later contrived the reflecting quadrant and Hadley in 1731 and Newton in 1742 also made improvements in the instrument, which they called an Octant. Newton's instrument consisted of a sextor of brass, the arc of which, though only equal to one-eight part of a circle, is divided into 90o. A telescope is fixed along a radius of the sector, the object glass being close to the centre and having outside it a plane mirror inclined 45o to the axis of the telescope, and intercepting half the light which would otherwise fall on the object glass. One object is seen through the telescope, while a moveable radius, carrying a second mirror close to the first, is turned round the centre until the second object by double reflexion is seen in the telescope to coincide with the first. As constructed by Hadley the instrument could only measure angles up to 90o; but in 1757 Captain Campbell of the British Navy one of the first to use it assiduously, proposed to enlarge it so as to measure angles up to 120o, in which form it is now generally employed.

Rules of the Road at Sea

Quite independently of Hadley and Newton, the sextant was invented by Thomas Godfrey, a poor glazier in Philadelphia, in November 1730. Godfrey's instrument was a common sea-quadrant to which he had fitted two pieces of looking-glass in such a manner as brought two stars at almost any distance to coincide.

"If the sextant is employed on land, an artificial horizon, which consist of a basin of mercury protected from the wind by a plate glass roof with perfectly parallel faces, has to be used.

"Towards the end of the eighteenth and the beginning of the nineteenth century the sextant was much used on land for determining latitudes, but though in the hands of a skilful observer it can give results far superior to what one might expect from a small instrument held in the hand (or attached to a small stand) it has on shore been quite superseded by the portable Altazimuth or theodolite, while at sea it continues to be indispensable". (Encyclopoedia Britannica.)

The general rules of the road at sea, intended to prevent collisions, especially where steamships are concerned, are embodied in the following rhymes, prepared by Thomas Gray of the British Board of Trade:

1.—Two Steamships Meeting|—
When both side lights you see ahead
Port your helm, and show your *Red.*

2.—Two Steamships Passing|—
Green to *Green* — or *Red* to *Red.*
Perfect safety — Go ahead.

3.—*Two Steamships Crossing*|—
If to your starboard *Red* appear,
It is your duty to keep clear,
To act as judgment says is proper–
To port, or Starboard, back, or stop her.
But when upon your port is seen
A steamer's starboard light of *Green*
There's not so much for you to do
For *Green* to port keeps clear of you.

4.—*All Steamers must keep a good- look-out, and steamships stop and go astern if necessary*|—
Both in safety and in doubt
Always keep a good look-out;
In danger, with no room to turn
Ease her !—Stop her !—Go astern !

LIST OF SOME OF THE TERMS USED IN ICE NAVIGATION BY WALERS, SEALERS AND OTHERS

Floe—A large mass of floating ice.
Pan—A small floe or small piece; one that can be forced aside or slewed.
A field—A large body of ice that may be seen around.
Land floe—Ice frozen fast to the shore.
Packed ice—Are small pieces close together and held by the pressure of ice and currents.
Ice blink—Is a peculiar pale yellow reflection of the sky, indicating the presence of ice at a distance.
The ice pack—Is a large body of solid ice extending across the whole sea, and beyond which it is impossible to advance.
Slack ice—Is detatched so that it can be worked through. Ice is said to be slacking when it begins to be open so as to be navigable.
Running abroad—Ice is said to be running abroad when it opens out or slack away so as to be navigable.
A Nip—Ice is said to be nipping when it begins to close by reason of the action of the winds or currents, so as to prevent the passage of a vessel.
Calving—Ice is calving when the small pieces break off from the bottom and rise to the surface of the water.
A lead—Is a strip of navigable water opening into the pack.
A blind or lead pocket—Is a short opening into the pack, and terminating against solid or thick ice.
Hummocky ice—Is rough, uneven or thick ice.
Porridge ice—Is small finely ground up ice.
Slob—Is snow afloat and forming into ice.
Sish—Is thin new ice just formed in thin sheets.
Lolly—Is loose new ice.
Waking—Is the following in the wake of another vessel through leads and slack ice.
Backing running or butting—Is backing and running the ship at ice in order to force or head a way through it.
Slewing—Is forcing the vessel ahead against the corner of a piece of ice, with the intention of causing it to slew or swing out of the way, so as to force a passage by it.
Tracking—Is following along the edge of the ice pack.
Water sky—Is a dark and blueish appearance of the sky indicating open water beyond the pack.
Slatches—Are considerable pools of open water in the ice.
Swatch—Is a small pool of open water in the ice.
Swatching—Watching for seal around a swatch.
Wash—Is the sound of the sea breaking against the ice.
Rote—Newfoundland term for wash.
Rafting—Occurs when two pans meet with force, either by the action of the winds or currents, the edges are broken off or either rise on the top of our pass under the body of the pans.
Pressure ridge—Is the ridge or wall thrown up while the ice is rafted.
Growler—Is a more or less washed and grounded lump of ice which rolls about in the water formed from broken up bergs or detached pieces of heavy old arctic floe ice.
Decker—Rafter at a pressure ridge (Newfoundland).
Black sheet—Is thin dark looking ice with snow on it; usually found between pans of older ice. At night or at a distance looks like open water.

Collar ice—Is the margin of ice frozen fast to an island or shore. presenting an abrupt wall against which the floating ice rises and falls with the tide.

Beset—Inclosed on all sides by the ice.

TABLE giving the value of a Degree of Longitude for each Parallel of Latitude in geographival miles and Britian Statue Miles·

Lat.	Miles Miles	Miles Miles	Lat.	Miles Miles	Miles Miles	Lat.	Miles Miles	Miles Miles
0°	60.00	69.16	30°	51.90	59.89			
1°	59.99	69.14	31°	51.43	59.28	61°	29.09	33.53
2°	59.96	69.11	32°	50.88	58.65	62°	28.17	32.47
3°	59.92	69.06	33°	50.32	58.00	63°	27.24	31.40
4°	59.85	68.99	34°	49.74	57.34	64°	26.30	30.32
5°	59.77	68.89	35°	49.15	56.65	65°	25.36	29.23
6°	59.67	68.78	36°	48.54	55.95	66°	24.40	28.13
7°	59.55	68.65	37°	47.92	55.23	67°	23.44	27.02
8°	59.42	68.49	38°	47.28	54.50	68°	22.48	25.91
9°	59.26	68.31	39°	46.63	53.75	69°	21.50	24.79
10°	59.09	68.10	40°	45.96	52.98	70°	20.52	23.66
11°	58.90	67.89	41°	45.28	52.20	71°	19.53	22.51
12°	58.69	67.65	42°	44.59	51.39	72°	18.54	21.37
13°	58.46	67.38	43°	43.88	50.58	73°	17.54	20.22
14°	58.22	67.10	44°	43.16	49.75	74°	16.54	19.06
15°	57.96	66.80	45°	42.43	48.91	75°	15.53	17.90
16°	57.68	66.48	46°	41.68	48.04	76°	14.52	16.73
17°	57.38	66.14	47°	40.15	47.17	77°	13.50	15.56
18°	57.06	65.77	48°	39.92	46.28	78°	12.47	14.38
19°	56.73	65.39	49°	39.35	45.37	79°	11.45	13.20
20°	56.38	64.99	50°	38.57	44.46	80°	10.42	12.01
21°	56.01	64.57	51°	37.76	43.52	81°	9.39	10.82
22°	55.63	64.13	52°	36.94	42.58	82°	8.35	9.63
23°	55.23	63.66	53°	36.11	41.62	83°	7.31	8.44
24°	54.81	63.18	54°	35.27	40.65	84°	6.27	7.23
25°	54.38	62.68	55°	34.41	39.66	85°	5.23	6.03
26°	53.93	62.16	56°	33.55	38.67	86°	4.19	4.83
27°	53.46	61.62	57°	32.68	37.67	87°	3.14	3.62
28°	52.98	61.00	58°	31.80	36.65	88°	2.09	2.41
29°	52.48	60.49	59°	30.90	35.62	89°	1.05	1.21
30°	51.96	59.89	60°	30.00	34.58	90°	0.00	0.00

Esquimaux and English Vocabulary for Use of the Arctic Expedition.

(*Published by Order of the Lords Commissioners of the Admiralty.*)

PREFACE

The following vocabulary is compiled for the use of the Arctic expeditions, fitted out at the expense of the British Government, to carry relief to Sir John Franklin and his companions. It was begun specially with a view to the Behring Strait expedition, and we learn from the accounts of Cook, Kotzebue, and Beechy, that much intercourse took place during those voyages with the natives of the north-western coast of North America. It may also prove useful to the expedition about to sail for Lancaster sound.

The only existing published vocabularies of the Eskimaux language are contained in Fabricius's "Greenland and Danish Dictionary", 1904 in the account of Parry's Second Voyage in the years 1821-23; in Beechy's "Voyage of the Blossom in 1824-25": and in Sir John Ross's Voyage in 1829-33. The three last mentioned are thick quarto volumes and therefore of little use in that form for the daily requirements of parties absent from the ships or boats or on land expeditions. The object of the present work is to supply that want, and to furnish every officer and leading man in the Arctic expeditions with a book of ready reference that he can carry in his pocket without inconvenience.

The vocabulary is drawn up in three parallel columns, consisting of the dialects as spoken by the Natives in Kotzebue sound, in Melville peninsula and on the coast of Labrador. The authority for the first, which may be termed Western Eskimaux, is Beechey's "Voyage of the Blossom" above referenced to, with the addition of a few words from a manuscript vocabulalry of the late Captain Wolfe, R. N., who was a mate of the Blossom in her voyage to Behring strait. The authority for the dialect spoken at Winter island and Iglolik, which for distinction's sake may be called Central Eskimaux, is Sir Edward Parry's Second Voyage, evidently a carefully drawn up list of 800 words, to which have been added a few words from the only remaining fragment of an extensive vocabulary collected by Sir John Richardson, during a winter passed at Fort Franklin, from a native of Hudson Bay, but which was unfortunately lost. For the Labrador or Eastern Eskimaux, I am indebted to the kindness of the Reverend Peter Latrobe, well known as secretary, and to Mr Mallalieu, treasurer, to the Moravian Mission in London, who procured for me a translation by Messrs Kmoch, Hertzberg, Morhardt and Stock, and especially by the Rev. Z. Clitsch, all of whom have resided many years at the missionary settlements at Okkak, Nain, Hopedale, and Hebron on the coast of Labrador.

The people whom we term Eskimaux, but who call themselves Innuit, are spread along the whole of the Northern coast of America from Behring strait on the west of Greenland on the east; and there is little doubt that the same language is understood throughout that extent, varying, of course in dialect, but radically the same. We know, too, that Augustus, Frsnklin's interpreter from Hudson Bay, had no difficulty in conversing with the natives immediately to the west of Mackenzie's river, in 137 degrees west longitude. It may, therefore fairly be presumed that the Labrador vocabulary the only complete one of the three, will prove useful on whatever part of the shores of the Arctic sea the navigators may chanse to meet with the natives.

As before mentioned, these people call themselves Innuit, and do not know the word Eskimaux . This name, it is believed, is first mentioned by Charlevoix in his "Histoire de la Nouvelle France", who says that the natives of the east of Labrador, who then extended southwards to the river St. Lawrence, were called Eskimantik (that is. "raw fish eaters), in the Mohican idiom by their neighbours. the Abenakis, with whom they where commomly at war. If this is the true derivation of the name, it appears that the Eskimaux wêre only know to the civilized world by a nick-name given by their enemies.

If the extent of country be considered, the Innuit or Eskimaux is one of the most widely spread nations on the globe. We find them in Behring strait, occupying both sides of the strait, the Asiatic as well as the American: as the stationary Chukchis of Chuckchi Noss and Anadyr are doubtless Eskimaux, and many of their words are the same as those in use in Greenland. From Kotzebue sound and Icy cape they have spread eastward along the shore of the Ardtic ocean by the Colville, the Mackenzie, the Coppermine, and the Great Fish rivers to Melville Peninsula, and to Fort Churchill in Hudson Bay. They occupy the whole of the great peninsula of Labrador and the east coast of Hudson bay as far south as East Main river; also the islands between the coast of America and the pole as far as they are habitable, as well as both shores of Greenland, thus ranging through 140 degrees of longitude, or an extent of 3,500 miles.

The inquiry into the connection between the dialects spoken by this widespread nation and those spoken by the several tribes of Russian, America, is one of high interest. Inhabiting the northwestern extremity of America, these latter are divided from Asia only by the narrow channel of behring strait, so that of all nations of the New World they are nearest in contact with those of the Old. The generally received opinion as to the peopling of America is in favour of the passage from the old continent to the new having taken place by Behring strait, where the shortest distance to be traversed dœs not exceed fifty miles; a careful comparison, therefore of the languages spoken by the tribes resident on each side of the strait might throw some light on this question.

As an example of the connection that exists between the Eskimaux, the Chukchi, and other dialects spoken by the tribes in that region, I have inserted at the end of this vocabulary, a comparative table of a few words taken from Balbi's "Atlas Ethnographique," some of which show a great similarity, and there can be little doubt that they belong originally to the same language. Those who have leisure to pursue this subject, will find some useful information in the 2nd volume of the Archaeologia Americana, in a paper by Dr R. G. Latham, in the London Tthnological Journal, and in Bær's "Statische and Ethnographische Nachrichten", which contains the words collected by Admiral Von Wrangell in these regions.

A few words of explanation are necessary as to the orthography adopted in this vocabulary. It is very nearly the same as that first suggested by Sir William Jones in the Preliminary Discourse to the Asiatic Researches, vol.1, and since adopted by the Asiatic and Geographical Sociaties of London. The consonants retain their English value, and the vowels have the same invariable sound as in German, Italian, Spanish and other languages. Many reasons might be urged in favour of this system, but it will be sufficient in the present case to say that it is the same that has been pursued in the translation of the

Bible into the Greenland and Labrador dialects of Eskimaux. In order to save the reader trouble, the scheme is repeated at the foot of every page of the vocabulary, and it may be permitted to express a hope that all collectors of vocabularies will in future adopt the same system; or substitute a better scheme, and adhere to it. The scheme is as follows:—

"A" is to be sounded as in the English word 'father';
'a', dotted (the hick sound of 'a' common among the natives), as the 'u' in 'but';
'e' as in 'there';
'o' as in 'more';
'ai' as 'i' in 'time';
'ok' asin 'oak';
'g' as in 'get';
'i' as in 'ravine';
'u' as in 'flute';
'au' as 'ow' in 'how';
'ch' as in 'church';
'kh' as 'ch' in 'loch';
'r' and 's', dotted, require a forcible, or, if the term may be allowed a guttural sound of those letters.

Every vowel is to be sounded. The accent marks the emphatic syllable. The hyphens are only inserted for facility in reading.

At the conclusion of the vocabulary will be found a specimen of some dialogues on the first meeting with the natives, on preparations for an exploring expedition, the purchase of dogs, sledges, etc., with a few sentences to explain to the Eskimaux the object of the present expedition, and that a large reward will be given to any one who will first bring the joyful intelligence of the safety of Sir John Franklin and his companions.

JOHN WASHINGTON,

LONDON, March 1, 1850. *Captain, R. N.*

BRIEF SKETCH OF THE ESKIMAUX GRAMMAR. 1.

The language of the Eskimaux is far from being rude or imperfect It abounds in words expressive of common objects, and distinguishes slight shades of difference by appropriate terms.

Animals of the same species receive peculiar names according to varieties of age, sex, or size. The verb to fish is expressed by a different word for each kind of fish. Much, therefore, may be said in a few works, and with precision; but as might be supposed, the language has no words for abstract ideas. The words are variously inflected, but according to certain rules and provided with numerous affixes and suffixes, which render the language graceful and energic. Many words are connected together, or, as Humboldth appily expresses it, joined by agglutination, and blended into one, so that, like the North American Indians, they can express themselves at once with strength and brevity. This circumstance, however, renders it very difficult for a stranger to acquire a knowledge of it: and that only after a residence of some years among the natives.

Several of the letters in the English alphabet are wanting in the Eskimaux language, as f, j, q, x, z; and in the annexed vocabulary, of more than 2,000 words, b, d, g, l, q, and r, rarely or never begin a word; k is the letter of most frequent occurence.

1.—Chiefly from Crantz's History of Greenland, Vol. 1, chap. vi., p. 201, and Parry's Second Voyage, 1821-23.

The r and s are pronounced much more forcibly than is usual in English. Sir Edward Parry says the r approximates to the Northumbrian "burr", and the s to the ch in the Scottish woed "loch". The letters ng, followed by a vowel, as ang-nt, male, and ping-ahuk, three, are sounded invariably as in German, or as in the Scottish name "Angus", or as in the English word "hanger", and not as in "anger". The Eskimaux commonly vary the prononciation of their words, without altering the sense, and particularly so the women, who seem to be fond of the termination ng, as hiuting-a, ear, for hiuting-a; and niakoa, head, for niakok.

The accents generally falls on the last syllable.

The nouns substantive, as well as the verbs, have a singula dual and plural form; they have no distinction of gender, and no article. The dual generally ends in k. and the plural in t, but there are exceptions.

SINGULAR	DUAL	PLURAL
Nuna (land)	Nuneik	Nuneit
Norrak (calf)	Norrek	Norret
Uyarak (stone)	Uyarkek	Uyarket
Iglo (house)	Igluk	Iglut
Innuk (man)	Innuk	Innuit
Tuktu (reindeer)	Tuktuk	Tuktut

Nouns may vary to a great extent; as diminutives, e, g., nunarsuk, a small land, augmentatives, as nunarso-ak, a great land.

The declension of nouns is simple. The genetive only add a "b" (or an "m" before a vowel) to the last syllable.

The personal pronouns always follow the verb. They are:—

U-ang-a-I
Igwit—thou or you.
Oma—he.

U-a-gut—we.
Illipsi—ye.
Okkoa—they.

Apparently, a part of these pronouns is suffixed to the nouns as possessive pronouns; as:—

Nuna—land.
Nuna-ga—my land.
Nun-at—thy and.
Nunang-a—his land.
Nuna-rwut—our land.

Nuna-rwuk—land of us two.
Nuna-rse—your land.
Nuna-rsit—the land of you two.
Nuna-it—their land
Nuna-ik—the land of those two.

The propositions, if words may be so called which always follow the noun, are; mik, signifying at, with; as iglu-mik-pok, he is at the huts; mit, from; as nuna-mit, from land; mut, to; as u-agna-mut, to the westward; mi, in or upon; as unia-mi, in the ship; sikko-mi, upon the ice; and Crantz adds kut and agut, through and round.

The verbs have been divided into four conjugations, according to their terminations:—

1—in *kpok*, as *ermikpok*—he washes himself.
2—*rpok*, as *mattarpok*—he undresses.
3—*pok*, as *egipok*—he throws away.
4—*ok* and *wok*, as *piyok*—he receives, and assawok, he loves.

The negative form of the verb is marked by the termination ngilak: thus, erming-ilak, he does not wash himself.

There as three tenses: present, ermikpok; past, ermisawok and ermigomarpok; the first expressing simple futurity, the last denoting decision. In like manner the imperative mood is of two kinds, the one gently reminding, as ermina, pray wash yourself; the other commanding, as ermigit, wash yourself.

The third person singular may be considered the root of the verb, and generally ends in ok: and most of the verbs in the vocabulary are inserted in this person.

The verb piwok is of constant use, somewhat similar to the English words get and do; it is difficult to assign its meaning—perhaps to obtain or accomplish.

It requires much study to master the inflections of the verbs, and they are too numerous to be entered upon here. The following may be taken as a specimen:—

Ermik-ponka—I wash.
" *-polit*—thou washest.
" *-pok*—he washes.
" *-pogut*—we wash
" *poguk*—we two wash.
" *-potik*—you two wash.
" *-pose*—you wash.
" *-put*—they wash.
Nappa-lang-a—I am well
" *-latit*—thou art well.
" *-lak*—he is well.
" *-lagut*—we are well.
" *-lase*—you are well.
" *-let*—they are well.

The participle, which supplies the want of an adjective, is the same as the preterite of the indicative; as ermilaukpok, one who washes; in the future, it makes ermissirsok , about to wash.

The conjunction lu (and) is added to the end of the word, like the Latin que. A common interjection is Hei; or Hei-ya! but a great degree of astonishment mixed with pleasure, is expressed by the word atamnatrani; according to Parry; or Tatamnamak! in Labrador.

The numerals in general only extend to five, occasionally to six, and then begin again. In the Labrador dialect they are as follows:—

Attau-sk—one.
Maggok—two or seven.
Ping-asut—three.
Sittamet—four or nine.
Tedlima—five.
Bing-asu-yoktut—six.
Sittamau-yoktut—eight.
Telliman-yoktut—ten

Six and seven are sometimes expressed by argwenrak and argwenraktowa, respectively. In counting, they use their fingers; but Sir Edward Parry says, at Melville island they did not use their tœs to count, as in Greenland.

The form of answering a negative question differs from any European language: thus the reply to piomang-ilattit ? will you not have it ? must be nagga, no if the affirmative be intended; on the contrary, if the offer is declined the answer is, Ap, pionang-ilang-a; Yes, I will not have it.

The Eskimaux make much use of winks and nods in conversing; the former are always intended to convoy a negative meaning. A nod, as with us, implies an affirmative.

It may be useful to add that in the vicinity of Behring strait (as we learn from Beechy's "Voyage of the Blossom", and more recently from Captain Kellett, holding up the arms at an angle of 45 degrees on first meeting the natives, whether in a boat or on land, is a sign of peace a friendliness, and on coming to close quarters rubbing noses is the most approved mode of salutation. Also, that if a line be drawn on the ground round a party of Europeans engaged on shore or on the ice in making observations, or otherwise not wishing to be disturbed, the natives will understand that it is intended as a barrier they are not to pass, and, generally speaking, will respect it.

THE CRUSE OF THE MINNIE MAUD

(Prepared by A. B. Reader 1912-13)

Eskimo
Numerals

1....Attawson 2....Markow 3...Pingi-shoot
4....Tisshi-man 5....Teddli-man 6....Ak-binnik-poo
7....Markoning 8....Pingi-shoo-ning
9....Tisshi-maning 10....Koli

Prefix "*More than ten*"—Koli-ood-looti.

11....Shinni-voon or Koli-attowson or Shinni-kee-koon
12....Markoning or Koli-markow
13....Pingi-shooning Shinni-raktooning or Koli-pingi-shoot
14....Tishi-manni Shinni-raktooning or Koli-tisshi-maning
15....Tedli-man Shinni-raktooning or Koli-tedliman
16....Ak-binnlk rak-tooning or Shinni-kee-koon or Koli-ak-binnik-poo
17....Markoning shinnink rak-tooning or Shinnik-kee-koon markoning, or Shinnik-kee-koon Tisshi-maning
18....Pingi-shooni-shinnik-raktooning or Shinnik-kee-koon or Koli pingi-shooning
19....Tisshi-maning Shinik rak-tooning or Koli-tisshi-maning
20....In-yooig-nahvo
21....In-yooig-nahvo attowson or Azzi-ruk-tuk-poo
22....In-yooig-marko-nahvo
23....In-yooig-pingi-shoot-nahvo or Pingi-shoot-na-luk-poo
24....Tesshi-man na-luk-poo or In-yooig tisshi-man-nahvo
25....In-yooig-tedli-man-nahvo or Tedli-man na-luk-poo
26....In-yooig-ak-binnuk-poo
27....Marko na-luk-poo in-yooig
28....Pingi-shooning na-luk-poo in-yooig
29....Tisshi-maning azzi-ree-tuk-poo
30....In-yooig koli-nah-vo
40....In-yooig tesshima-nah-vo
50....In-yooig Teddli-ma-nah-vo
60....In-yooig Ak-bin-nuk-poo
70....In-yooig-marko-ning
80....In-yooig Pingi-shooning
90....In-yooig Tisshi-ma-ning
100....Koli-ruk-pa, or Koli-koli
200....Ai-pirrik-tuk-poo
300....Ai-pirrik-tuk-poo pingi-shooning
400....Ai-pirrik-tuk-poo tisshi-maning
500....Ai-pirrik-tuk-poo ted-li-maning
600....Ai-pirrik-tuk-poo ak-bin-nuk-poo
700....Ai-pirrik-tuk-poo marko-ning
800....Ai-pirrik-tuk-poo pingi-shooning
900....Ai-pirrik-tuk-poo tisshi-maning
1000....Ai-pirrik-tuk-poo ted-li-maning
2000....Ai-pirrik-tuk-poo in-yooig-marko-ning
3000....Ai-pirrik-tuk-poo in-yooig pingi-shoot
4000....Ai-pirrik-tuk-poo in-yooig tisshi-man
5000....Ai-pirrik-tuk-poo in-yooig tedli-man
10000....Ai-pirrik-tuk-poo in-yooig Koli

ESKIMO ALFABET AND SYMBOLS

(BY REVD E. J. PECK)

Vowels.—a, (eh), ᐁ .e. (ee), ᐃ .o, (oh), ᐅ .ă, (ŭ), ᐊ .i, (ai), ᐂ .u, (oo), ·ᐅ a, (ah), ᐊ .ow, (au), ᐊᐅ .oi, (oy), ᐅᐁ .

Consonants.—p, ᐸ ; t, ᑕ ; k, ᑲ ; g, ᒐ ; m, ᒪ ; n, ᓇ ; s, ᓴ ; l, ᓚ ; Ye, ᔾ ; v, ᕙ ; r, ᕐ ; h, ɞ ; ng, ᓐᒃ ; rk, ᕐᒃ

Syllables.—pa (peh), ᐯ .pee ᐱ .poh ᐳ .pu (pa) ᐸ .pai ᐯ̣ .poo (pu) ᐳ· .pah ·ᐸ—ta (teh), ᑌ .tee ᑎ .toh ᑐ .tu (ta) ᑕ .tai ᑌ· .too (tu) ᑐ· .tah ᑖ ka (keh), ᑫ .kee ᑭ .koh ᑯ .ku (ka) ᑲ .kai ᑫ· .koo (ku) ᑯ· .kah ᑳ ga (geh), ᒉ .gee ᒋ .goh ᒍ .gu (ga) ᒐ .gai ᒉ· goo (gu) ᒍ· gah ᒐ· ma (meh), ᒣ .mee ᒥ .moh ᒧ .mu (ma) ᒪ .mai ᒣ· .moo (mu) ᒧ· .mah ᒫ na (neh), ᓀ .nee ᓂ .noh ᓄ .nu (na) ᓇ .nai ᓀ· .noo (nu) ᓄ· .nah ᓈ . sa (seh), ᓭ .see ᓯ .soh ᓱ .su (sa) ᓴ .sai ᓭ· .soo (su) ᓱ· .sah ᓵ la (leh), ᓓ .lee ᓕ .loh ᓗ .lu (la) ᓚ .lai ᓗ· .loo (lu) ᓗ· lah ᓛ ya (yeh), ᔦ .yee ᔨ .yoh ᔪ .yu. (ya) ᔭ .yai ᔦ· yoo (yu). ᔪ· .yah ᔮ va (veh) ᕓ .vee ᕕ .voh ᕗ .vu (va) ᕙ .vai ᕓ̇ .voo (vu) ᕗ̇ .vah ᕚ .ra (reh) ᕃ .ree ᕆ .roh ᕈ ru (ra) ᕋ .rai ᕃ̇ .roo (ru) ᕈ̇ .rah ᕌ .ngah ᖓ ngee ᑭ ngĭ ᓂ .ngoo (ngu) ᐅᑯ .

ESKIMO VOCABULARY

(Used by natives of North Baffin Land)

Prepared by A. B. Reader at Pon'ds Inlet

1912-1913

A

Above, (on top—Kai-sun.
Above, (upstairs)—Kah-lik.
Across, (on the other side)—Akki aning.
Adam's island—Too-id-joon.
Adam's sound—Kai-yoo-ting-ma
Afternoon—Wah-ree-yoo.
Afraid—Kappi azook-too, ee-la-ra sook-too.
Afraid, (very much)—Kappi ammi-shoot, Alian-akaroo.
Ask why she or he does not come—Shoo-kin-kai-yoo nee lung-illa.
Aunt—Attunga. Ung-ugga.
Autumn—Ikki-ak-sah.
Axe—Ood-lee-ma-oon.
Axe, (to chop with)—Ood-lee-mark-to.
Afraid, (I am) — Ee-la-ra-sook pooma.
Afraid, (you are) — Ee-la-ra-sook-pootit.
Again—Ak-shoot, Attee-attee.
Air, (atmosphere)—Tak-seerk-too, See-lah.
Albert Harbour—Kirri-yook-tsua.
Alive—Tookung-ee-toon-Ig-noi-yo.
All—Tah-mow-mee, Ah-wah-ting, Attan-uk slootee.
All right, (enough)—Tub-ha-Pee-yooi-yook.
All the same — Ad-jing-ha-Tai-mat-too.
All the time—O-kud-lik-to.
Alone—Kissi-mah.
Alone, (myself I) **all alone.** — U-wang-ah. Kissimah.
Anchor—Kish-own.
Anchor, (to anchor)—Kish-uk-to.
Angry, (annoyed)—Ning-nak-too, Kow-muk-too.
Anus, (vent)—Itti-yeng.
Arctic Bay — Toon-noon-ah-roosa
Arctic Sound—Toon-neen.
Are, (they are, it is so)—Ak-soo-ee-lah.
Are, (they are in the act of—Kai-ming.
Arm—Tell-ehg. Ag-gah-tee-gan.
Arrow—Kat-tyoo.
Ask him—Ok-kar-harsi-yak too.

B

Back to front — Sed-look-in-ai-yook.
Back to front — Sed-luk-ah-see mai-yo.
Back of neck—Toona-shook.
Bad—Pee-yoong-ee-too. Pee-wik-too.
Bad—Ar-koom (Nasty).
Bad (very bad)—Pee-yoong-ee-too-arlo.
Bad man—Kah-loon-ai-yoo.
Bag, (small)—Nah-poon.
Bag, (sack) — Kah-wittee-Ik-pee-ard-jioo.
Baillargee Bay—Kai-nak-soo-ard-lioo.
Barrel, (cask)—Kutt-oh-wiya.
Beach, (a flat)—Oo-lee-nung, Tin-neen-nung.
Beads—Sah-pung-un.
Bead breast fringe—Sak-keeya-roti.
Bead shoulder fringe—Too-eeya-roti.
Bear, (polar)—Na-nook.
Beetle—Kai-loo-goo-arlee.
Begin—Arri-booma.
Belch (to)—Nik-see-ark-to.
Belly—Nah-jee-ka.
Belly, (my belly is full)—Nah-jee ruk pooma.
Below, (underneath)—Ud-lin.
Belt—Tuss-see.
Bend down (to)—Kai-tikki-sow-oon.
Better—Pee-yoo-nuk-sah.

Biceps—Kai-too-an, Ak-sah-ko.
Big—Ang-ee-yoo.
Big, (very)—Ang-ee-you-arlo.
Bino, (culars—Igloo-wee-lee.
Bird—Ting-mee-ah.
Birds—Ting-mee-sah.
Birds, (place of)—Kak-kood-loo-in
Birth, (to give)—Ir-nee-yo.
Biscuit—Sib-boh-mee.
Bite, (to)—At-tirri-neeto.
Bitter—Mum-mung-ee-too.
Black—Kirri-neeto.
Black, (eyed)—Karren-arik-to.
Black, (haired)—Keerg-ni.
Black and white stripes (caribou hair cap, cap decoration)—Udlark-to, Kip-pezzi-ark-too.
Blacksmith—Ka-jik-to.
Bladder—Nah-kassoo.
Bladder, (nosed seal)—Ap-pah.
Blanket—Kai-pee.
Blind, Blindfold—Mattoo-oord-lee
Blood—A-ow.
Blow, (to give a)—Pingi-see-mee-tanna.
Blow, (puff, exhale)—Soo-pee-yoo.
Blow the nose—Tarkeek pooma.
Blow out the light match etc—Kah-mik-ta.
Blow hard, (to wind)—Noori-ad-looni-loo.
Blue — Toong-ee-yoota, Koog-nook-ta.
Blue-eyed—Kai-yoo-arlo.
Blunt—Ee-kee-to, Keena-rag neetO
Boat, (ship)—OO-mia.
Board, (wooden)—Koo-vee-ar-to.
Bodkin, (ivory)—Nee-ekki-town.
Body—OO-win-ning.
Boil, ulcer—Poo-wik-too, Ai-yoo-wark-too.
Boiler, (large tin)—Kut-tan.
Bone—Ag-gow, Chowna, Sow-oona
Bone ring (for dog trace)—Oork-so, ok-sik.
Book—Oo-kah-lee med-jen.
Boots—Ka-ming.
Boots, (take off your boots)—Ka-ming ah-looti.
Borden Peninsula — Arkoo-rik-kuttaro.
Bosun, (Gull or Hawk)—Ishoonga.
Bottle—Ar-ree-yoh.
Boulder, (large)—Ig-nah-loo.
Bow, (and arrow)—Pee-sikki-see.
Bowels—Na-ra.
Bowels, Intestines—Akko-anga.
Bowels, (to act freely)—An-naria-zook-too-arlo.
Bowels, (to act freely)—An-naria-took-too.
Box, (wooden)—Ee-glee-via. Ik-tee-oor-bee.
Box—Id-loo-iya.
Boy—Soo-oo-sah, Kid-la.
Boy, (small)—Noo-ko-pee-ya.
Boy, (young male of any species, animals, birds, men—Noo-tar-rak
Bracelet—Tall-ee-see-yen.
Brace and Bits in handle—Nee-oo-tah.
Braces—OO-wittee-ootee.
Brain—Sow-ah-nah.
Brass—Kak-or-lin-Poo-koo.
Brass forehead hand—Kow-oon.
Break, (to)—Now-wik-po, Now-wik-too.
Break, (to break glass, crockery etc)—Sukko-miktoo, So-ruk-too.
Breast, (chest)—Suk-bee-ya.
Breasts—Noo-lee-ah, Ibbi anya.
Breathe, (to)—Nee-ook-troo.
Breathe out exhale—An-nuk-sah-toh.
Breeches (caribou)—Kah-gleep.
Breeches, (sealskin)—Nitto-kotee.
Breeches, (cloth)—Koo-garoo
Bridge of nose — Arkoolee-ah-kuttak.
Bright, (clear)—Ig-gah-lah.
Bring—Kai-joon, Kai-siggo.
Broad—See-lik-to.
Brodeur Peninsula — Arkoo-rik-koo-taroo.
Brodeur Peninsula — Arkoo-lee-ah-kuttak.
Broken—Now-wik-poo.
Broom, (brush)—Sang-moon.
Brown — Ee-zook-ta, Keyan-nak-too.
Brown, (eyed)—See-ung-nah.
Brother—Noo-kah Ung-nah.
Brothers—Noo-ka-ra.
Brush, (piece of)—Ee-week-soo-ah
Bubble—Ting-mee-gark-to.
Bucket—Kut-tah.
Build, (construct)—Igloo-lee-yoo.
Bullet—Ah-keek.
Bumble, (bee)—Ig-goo-tah.
Burn—Ikko-muk-too.
Business—Isso-mai-yoh.
Busy, (to be)—San-nang-wak-too.
Busy, (I am busy to-night)—Oo-gnoo u-wang-ah isso-mai-yoh.
Busy, (very busy)—San-neh-yoo-arlo.
Butterfly—Ta-gah-lee-kee-sah.
Buttocks—Oh-pat-teeka.

Button — Issi - ree - oh, See-ah-go (Igloolik).
Button Point—Sen-nown.
Buy—Nee-oo-wik-too.
Bye and bye, (later)—Wah-tchero.
Bylot Island—Kai-Giook-tah.

C

Cache—Kaing-ni-ak.
Calf, (leg of)—Nak-kai-shug-nah.
Call,(how do you ?)—Kissh' moona
Calm sea, (water)—Ook-soo-ark-too.
Canada Point—Ik-kak-tooria.
Cannibal, (he is a)—Ee-nuk-took-too-arlo.
Cannibal, (I am a)—Ee-nuk-took poonga.
Canoe—Ko-took-sa-eer, Kayak.
Cap—Nas-sart-looga.
Cap,(for pipe)—Mattoo wah-taima
Caps, (percussion)—Seeg-nee-tah.
Cape Adair—King-ard-joo.
Cape Bowen—Ee-jook-too.
Cape Crawford—Kan-ya.
Cape, (headland)—Nee - ard - joo, Noo-wah-dla.
Capsize, (to)—Oo-mee-yoo-ee-yoo.
Cards, (playing)—Mukki-towti.
Card,s (game of)—Muk-kee-tin.
Carry on back, (to) — Nag-mook-too.
Carry child on back, (to)—Am-mark-too.
Cary, (you carry on back)—Ibbin am-mang-eeto.
Carry, (he carries on back)—Oona am-mang-eeto.
Cartridges—Soon-iga.
Cartridges, (empty)—Poo-koo.
Cartridges, (loaded)—Soo-nah-ga.
Cask—Kat-tow-iya.
Catch, (Take, capture) — Mikki-yark-to.
Catch, (to)—Ak-kuk-para.
Catch, (I catch)—U-wangah ak-kuk-para.
Catch, (you catch)—Ibbin ak-kuk tenga.
Catch, (he catches)—Oona ak-kuk pung-in.
Cat's craddle, (game with string) —Ai-ya-ha.
Certain, (I am not)—Shee-bo-go.
Certainly—Inni-ola, Am-mee-lah.
Change, (to)—Akki-lee-yo.
Cheeks—Oo-roo-ark-o.
Cheeks,(fat cheeks)—Oo-roo-ark-o too-ee-yoo.
Cheeks, (thin cheeks) — Oo-roo-ark-o pooti.
Chest, (breast)—Sug-vik.
Chew, (to)—Tomma too-ad lunga.
Chewing tobacco—Ta-bakka-mee
Chief—Kow-bak-to.
Child—Noo-tuk-kun.
Child, (the child wants to eat) — arpa-pug-leeko.
Chop with axe, (to) — Ood-lee-mark-to.
Claws—Koo-king.
Clean—Puk-koo-ee-ya.
Clear, (bright)—Ig-gah-lah.
Clever—Kow-ee-yoo, Mey-ee-yoo.
Cliffs, (where sea-birds lay eggs)—Kah-kood loo-in.
Close, (near)—Kree-moosi.
Closer—Kai-nee-kud-loo-go.
Clouds—Nooi-ya.
Clyde River—An-now-loo-elli.
Coal—Kee-yook-sah.
Coal at Canada Point — Kirri-muk-too.
Coal mine—Kee-yook-sah-ping.
Coat—Jai-ka.
Co-ition—Kooni-moon.
Cold, (noun)—Ik-kee.
Cold, (adj)—Iglee-yuk-too.
Cold water—Miggli-nuk-too.
Cold in the nose, (rheum)—Soor-dloo Koork-too.
Colour—See-arng-nung.
Comb—Id-lai-oo-tee, Id-la-goh-tin
Comb, (to comb the hair)—Id-lee-ark-to.
Come, (to)—Kai-yo.
Come back (to)—Oo-peer-nuk-sah
Come early, (to morrow morning) —Oo-mik-pen kai-niak-pooti.
Come in—Kai-eet.
Come, (thou)—Kai-lee.
Come and eat—Oo-ee-yook Kai-eet.
Come, (are you coming)—Kai-ah-ruk-pee.
Come, do you comme from (over there)—Akki aning arkpee.
Come, (he is coming)—Ee-set-ton.
Come (I come from over there)—Akki aning ark-pooma.
Come, (I come from my igloo) — Igloo-ning ark-pooma
Come, (I will come presently) — U-wangah wah-tchero anni ruk-to
Come,(tell him to come)—Oo-kow-tee niak-kan—Attee-loo-taro Kai yin nee lungi-lung—Kai-koo-yow a-rowa-lee.

Come, (tell woman to come)—Arg-na-mee Kai-yoo.
Come, (tell her not to come) — Oo - kowt - lee lao kai - nee-vng-moon.
Come,(when did you come)—Akki-lar-poo.
Come,(when will he come)—Oh-ka-na Kai-yak-pee.
Come, (where do you come from ?)—Nga-kin-nga-pin.
Come, (where does he come from)—Nga-kin-oona.
Come, (where do you come from)—Takko-warra, Nga-kin-nga-pin—Nga-kin-kai-pee—Kai-ya luk ka-nee.
Come (why do you come ?)—Nga-kin ibbin kai-yo.
Come, (will come no more)—Kai-jai-yoo-nuk-too.
Construct, (build to)—Igloo-lee-yoo.
Cook, (to)—Oo-tee-yoo.
Cooking Pot—Oo-koo-see
Copper—Kan-noo-ee-yook.
Cork—See-ming.
Cork (piece of cork)—Po -ping.
Corner—Tirrik-kow-ah-nee.
Cough—Kovee-urk-sook-too.
Cousin, (either sex)—Ig-gorin.
Cousin, (children of 2 brothers or two sisters)—Anoo-ter-uttin.
Cover (to)—Ee-yoo-ee-yoo.
Crane)Tad-ee-gark-tchoo-ah.
Crooked—Sang-oo- ee-uk-to.
Cross over (to)—Ik-kee yan.
Crow—Too-doo-a.
Cry, (howl) to—Kee-ai-yoo.
Cup—Im-woi-soo.
Cup, (tin cup, pannikin)—Ig-noo-see-ya.
Curl, (on girl's head)—Peerka-nik-ta.
Curl, (on boy's forehead) —See-boonga.
Cut, (to)—Kip-peeli.
Cut off (to)—Nah-kut-too.
Cut, (to cut up meat of any kind)—Ah-goo-eh-yoo.
Cut wood (to)—San-nang-wak-too.

D

Damp—Ka-zook-too. Pan-nik-poo. —Kai-you-king-ai-yoo.
Dance—Moo-merrin.
Dance,(to)—Moo-muk-toon. Moo-meerk-too.
Dark—Tah-mee Tark-to.
Daughter—Ah-ninga.
Daughter of father—Ang-oh-ta.
Daughter of mother—Eer-nunga.
Daughter in law—Oo-koo-ara.
Dawn—Nooi-luk-too.
Day—Oog-loo.
Day, (after to-morrow) — Kowk-pen-oong-ah-lee-eh-ga.
Day, (early to-morrow morning)—Kow-look-pen.
Day, (evening sundown)—Nee-pee-you.
Day, (last night)—Ee-puk-rcha.
Day, (mid-day, noon)—Kuk-kah-nee.
Day, (morning)—Soo-koo-neh luk-too.
Day, (to-morrow morning) — Ood-lah. Oo-blah-ko.
Day, (to-day)—Oo-ah-ree-ani, Oo-gloo-mi.
Day, (to-morrow)—Kowk-pen.
Day, (tonight)—Ood-noo.
Day, (yesterday)—Ood-loomi.
Daylight—Kow-ma-poo.
Dead — Too - kung - ai - yo. To-ko. To-ko-bo.
Dead man, (Corpse)—Ee-nung.
Deaf—Too-see-an-eetoo.
Deep, (very deep)—Itti-yoo-arlo. Ook-sook-too-arlo.
Deer, (caribou)—Took-too.
Deer skin—Am-mil.
Deerskin cap—Nai-suk-loo-un.
Deerskin cloak—Koo-li-tang.
Deerskin, (fringe or ears of Hood)—Nah-zov-kah-gee.
Deerskin, (fringe on bottom of Kilitang)—Nig-gia.
Deerskin,(head band)—Am-minga
Deerskin, (mittens) — Poo-ah-lo. Poo-ah-looka.
Deerskin, (shirt, hair inside)—At-tee-gee. Ah-tee-ah.
Deerskin, (sleeping bag)—Poh-oo.
Deerskin, (sleeping rug) — Ma-minga.
Deerskin socks—Pee-nah-ran.
Deerskin, (steel scraper)—Mam-mia.
Deerskin trousers, (hair inside)—Il-loo bud-da.
Deerskin trousers, (hair outside)—Kah-gleep.
Deer, (hair)—Pee-luk-took-too.
Deer hair, (to scrape off)—Pill-yuk took-too.
Deer sinew,(for thread)—Ee-vel-lo

Deer teeth—See-boo-tee-ah.

Deer, (teeth sewn on leather band) —Took-too see-boo-anni.

Deer, (to hunt, shoot or stalk) — Tooktoo koo-kirri-yarg-too.

Devil — Toong-ah, Too-pee-lan.— Torna-suk, Kunn-ar-loon.

Diamond, (glass)—Al-lee-goh.

Die, (to)—Too-koo-eelya.

Different — Idli - ung-eh-yo, Idli-ar-lo.

Difficult, (hard)—Ak-seor-loor-in.

Dirt—Powk.

Dirty—Pow. Ee-peern.

Dirty, (very dirty)—Pow am-mi-shoot.

Diver, (gull)—Kak-kood-la.

Dog—Mik-ki.

Dogs howling—Mik-ki meer-gohk too.

Dogs, (to right)—Wo-a. Wo-war-ra

Dogs, (to left)—Ar-ree. Ar-kai.

Dogs, (go on)—Tchek-tchek. Hutt-Hutt.

Dogs, (stop)—Oh-a. Shoo-oo.

Dog trace—Ippi-yoota.

Do not, (don't)—Ai-ee-na.

Doobaunt, (tribe of Eskimos) — Seeko-sooi-lung-nung.

Door, (gate)—Ho-Kwanga.

Door of igloo—Ook-wa.

Door, (open the door)—Mattoo-ee-roon, Nuk-pig-goon.

Door, (shut the door) — Oo-mee-yak-poo, Oo-mee yan-nik-poo.

Door, (shut the door, imper) — Oo-mig-lee.

Door, (shut the igloo door) — Ook-wa ar-lee.

Doorway—

Down—Ab-ah-to.

Down below—Ud-lin.

Drag attached to harpoon—Nee-yoo-tuk.

Drawers, (woolen)—Nee-yoo-tuk.

Dream, (to)—Shin-nuk-took-too.

Drink, (to)—Nee-ook-see-oh.

Drink, (to drink milk)—Im-minga.

Drive dogs, (to)—Ingi-kut-tee-yo.

Drop, (to)—Kut-tak-po.

Drunk, (intoxicated)—Im-meerk-look-kai-yak.

Dry—Pan-nook-to.

Duck—Kig-goori-ark-tchoo.

King Eider—Mee-ti-uk.

Long-tailed Jaeger — Aggi-ark-tchoo.

Dung, (excrement)—An-nung.

To excrete—An-nuk-to.

E

Eagle—Kig-gabbi-ark-too.

Ear—See-yoo-tee.

Early—Kow-lee.

Very early—Cho-kai-yoo-arlo.

Early tomorrow morning—Kow-look-pen.

Earth, (the)—Ang-ma-looki-tah.

East—Mah-nee.

From the east—Marng-ung.

To the east—Mow-nga-ga.

Easy—Kai-toong-alla-ga.

Eat—Nirr-ee-yo. Oo-ninga.

Come and eat — Oo-ee-yook kai-eet.

Eat plenty—Kark-took-too.

Good to eat—Pee-yoo-ee-yoo.

Have eaten plenty—Ar-kai-tak-pooma.

Have not eaten, am hungry — Pee-yoo-ma ruk pooma.

I have eaten well—Ikki anna ai yowk tak-poo.

They are eating—Kai-ming nirr-ing-ma.

To eat a man—Ee-nuk took-too.

We are eating—Kai-ming-nirr-ee-yo.

Edible roots—Koong-oo-lee, Ai-ra.

Egg—Mun-ning.

Eight—Pingi-shoo-ning.

Eight o'clock—Pinga-shoo-an.

Eighteen—Koli pingi-shooning.

Elbow—Ik-koo-see

Eleven—Sinni-yoon, Shin-nee-yo.

Eleven o'clock—Shin-ning-an.

Elwin Inlet—Kai-nak-tloo-ar-pee.

Emptey — Now-wik-para, Il-loo-luk-kan-ee-to.

Emptey cartridge—Poo-koo.

Enough—Tub-ha.

Erik Harbour—Ig-sook-too, Kai-nak-tloo-ark-tchoo.

Eskimos—In-yoo-in.

Everybody—Ab-bah-no.

Everything—Ah-wah-tik.

Evening, (sundown)—Nee-pee-yoo

Evil eye, (the)—Ee-jinga.

Excretion—An-nung.

To excrete—An-nar-to.

Eye—Ee-yee.

Eye, (brow)—Kud-bloo.kah.

Eye, (lash)—Kinna rid-jen.

Eye, (lid)—Toona ee-lee-yo.

Exclamation, (my Goodness, what a big one)—Wah-kud-lunga.

Excited—Oo-ning.

I am excited, nervous—OO-ning

ak pooma.
You are excited, nervous—Oo-nirg ak pooti.

F

Face—Kee-na.
To lie face down—Pah-nuk-too.
To lie face up—Noo-kud-luk-too.
To turn face down—Poo-seeto.
To turn face up—Mah-keet-to.
Fall, (to)—Too-na-luktoo, Pard-luk-too.
Fall, (slip, to)—Wad-look-too, Issi-wad-luk-too.
Fall over, (to)—Koo-rik-koo-ruk-poo.
Far away—Oo-ar-zik too-ar-loo. Pah-nee-ar-lo.
Far off land—Noona pah-nee-arlo.
Far off ice—Seeko oo-nan-ee-ar-lo
Farewell,(goodbye)—Tah-bow-oo-teh.
Fart—Nee-luk-too.
Fast, (swift)—Too-ar-rurg-in, Soo-kelli.
Very fast—Soo-kai-ar-lo.
Fasten tightly, (to)—Ak-soo-ar-lo
Fat—Koo-ee-nee-yoo, Too-ee-yoo.
Father—At-ta-ta, An-nik-ta.
Father to son—Eer-nug-ga.
Father to daughter—Pan-nee-ga.
Father in law—Sak-keenga.
Feathers—Meerk-Koonga, Meerk-wa, Ark-serrik-see-yo.
Feather wiper—Ik-hoon.
Female—Koo-ni.
Small femele—Nibbi-ark-tcha.
Fever, (to have)—Ee-pee-kee-juk-too.
Fifteen—Koli tedli-maning.
Fifty—In-yooig Tedli-man-ah-yo.
Fight, (to)—Pingi-see-mee-yak-too
File—Ag-gee-ya.
Find, (to)—Nan-ni-var-ra Teego-war-ra.
Finish, (to)—No-ook-poo.
Finished — Noong - ook - pa, Pee-nissi.
Fill (to)—Ill-yoo-luk-para.
Fill with water, (to)—Im-mik-para.
Filled, (replete)—Tai-tak-to.
Fingers—Kah-mung-min.
Thumb—Kud-loo-a.
Forefinger—Tee-kee-rah.
Middle finger—Kiddo kleerah.
Third finger—Mee-kiddi-lah-ha.
Little finger—Beer-koh.
Finger (nail)—Koo-kee-yoo.
Finger, (nails, claws)—Koo-king.
First, (class)—Pee-yooi-yook.
Fire—Ee-gah.
Fish—Oo-wah.
Big Fish—Oo-wak-tchoo-ah.
Smal sea fish, (varieties)—King-oon. Toola-ga-nah.—Kanni-yoo-arlan, Izzi-too-arlan.
Queer one-eyed sea-fish—Mit-tang-nah.
Fish, (hook)—Oo-gah-tchoo.
Five—Ted-li-man.
Five, (o'clock)—Ted-li-mung-an.
Flag—Sai-min, Ow-luk-koo.
To hoist the flag—Shan-nai-yo.
I hoist—U-wangah Shan-na-largo
You hoist—Ibbin shan-nargo.
Flag pole—Nah-pai-yo.
Flat beach — Oo-lee-nung, Tin-neen-nung.
Flat Point, (S.W. Bylot island) — Kaing-ni-uk-too.
Flint—Ang-mah.
Flint, (stone)—Ig-nung.
Flint, (barb for harpoon)—Ak-ki-koo-an.
Float (bladder— attached to harpoon—Ah-bah-tuk.
Florida water, (bottle of)—Tippi-tee-rown.
Flowers—Ow-billik-tunga.
Fly, (small, black)—An-nungee.
Fly, (to)—Ni-ed-luk-to.
Fog—Tark-sin.
Food—Nirri-nee-akto.
Fooling, (stop your)—Pirra-rek-town nerrin.
Foot—Izzi-kan.
Feet—Izzi-lee-kan.
Forearm—Ur-gowt.
Forehead—Kow.
Forget, (to)—Nah-loo-wara, Pooi-yook-para, Poo-ai-gooi-yoo.
I am forgetful—Poo-ai-go-pooma
Fork—Kah-kee-yah, Kar-ee-lia.
Forty — In-yooing Tesshi-man-ah-yo.
Fourteen—Koli Tisshi-maning.
Fox—Terri-ga-nee-ya.
To skin a fox—Terri-ga-nee-yato-koo-ee-aroo.
Freeze—Kwa.
Fresh,(water iceberg)—Pikka-rooi.
Friend—Ee-ling-nee.
Fringe round Koolitang—Nig-gia.
From (suffix)—Min.
From Igloolik—Igloolik-min.
Frozen — Kwa-ardlo-kuk-ee-yoo-arlo.

Full—Tai-tak-to.
Stove full of blubber—Ook-sook tak-ow-ee-ya.

G

Game of Cards—Muk-kee-tin.
Game of Cats Cradle—Auja-ha.
Game with Ivory ball and stylus—Peer-koo-tingi.
Game with lance and hanging ball—Nood-look-ta.
Gate, (door)—Ho-kwanga.
Get away from there—Sak-kah.
Get up from bed, (to)—Mukki-loolen.
Get out of bed (imper)—Mukki-loo-a.
Girl, (small)—Nibbi-ark-tcha.
Young female of all species—Nibbi-ark-tcha.
Young maiden—Nibbi-ark-tcha weenung.
Give, (to)—Kai-jo.
Give me — Pee - ta - ree - yo. Kai-tchoo-arlee.
Give me water—Im-ma rooma.
Give me the next time you come—Shoona gam-min.
Glacier—Seerng-ming.
Big Glacier—Seerng-mee-arlo.
Glass—Al-lee-yo.
Gloves—Poo-ah-lo.
Gloves with hair lined fingers—Ar-gai-tchin.
Go, (to)—Oo-ard-luk-too.
I go—U-wangah luk-too.
I shall go—U-wangah lo-ai.
You go—Owd-lee-lark-to, Owd-luk-pee.
He goes—Oona lee argo.
Going, (to be)—An-nia rah-bin.
I am going—Owd-lee ruk pooma, Ikko gnaro ma oonia.
I am going there—Ik-kani-taima.
I am going to—Arng-moon.
I am going to Ponds Inlet—Ee-yuk-tsua arng-moon.
I am going home—An-nia gah-mee ruk pooma.—An-nia gah-mee a la ra-bee.
I am going to-morrow—Kowk-pen oona lee argo.
Where are you going friend ?—
Na-moon ook-wa eeling-nee ?—
Kah-na owd-lee ark-to ?—Kah-na owd-lee nee-ar lippi.—Ikko gnari ?
When did he go ?—Na-moon an-ni mak-ki.
Go away, (to)—An-na gark-to.
Go down, (to)—Puk-koe-to.
Go on deck (to)—An-nee-gee.
Go no more, (to)—Owd-lee jai-yoo-nuk-too.
Go out, (I)—U-wangah an-ni luk-too.
You go out—Ibbin an-ni luk-too.
Go up, (to)—Puk-tee-yo.
Go you?—Ard-looa, Azzi-wak-too.
God—Goti, Oonah-mee-ark-tsoo.
My God—Targoa ingoona.
(Exclam) My God. What has happened—Kah-nooi-too-ar-loo-ween.
Gold—Eerk-look-pah.
Golden Plower—Sow-kwa.
Gone—Owd-luk-to.
He has gone away—An-nee-yo.
Good—Pee-yooi-yook.
No good—Ar-ka, Too-koo-arri-ook' Pee-yung-eeto.
Very good—Pee-yooi-yoo-arlo.
Good for you—Narko pooti, Narko too-iyoo.
Good-bye—Tah-bow-oo-teh.
Good night—Tah-bow-oo-teh-nait
Good, (that is night)—Tiddli see yooma.—Man-na rowk-ta-tak-poo.—Mow-mattee googa ooma.
Goose, (wild)—Kung-oon.
Goose, (dung)—Man-nee.
Got—Tak-wa.
Have got plenty—Tak-wa ang-ee-yoo.
Have you got plenty—Tak-puk ang-ee-yoo.
Have not got—Man-nook-poo.—Peeta-rah nik-ta.—Peeta-rah nig-nam-mi.
Have only got a little—Mik-keeto koo-roo roo-min.
Grand-daughter—Am-mee-gee ung-a.
Grand-father—Ing-oo-tunga.
Grand-mother—Ing-oo-tunga.
Grand-son—Am-mee-gee unga.
Grave—Id-loo-viak.
Gravel—Too-ar-pai-ya.
Grease—Ip-pa-ringa.
Great—Ang-ee-yo.
Very great or large—Ang-ee-yoo-arlo.
Green—Toongi-yooki-sah.
Greyhaired—Kood-jook.
Ground-bird (small brown)—Ko-pen-ar.
Gull—Nowee-ya.
Small white gull—Koo-kood-la.
Gun—Koo-kee-yoo, Zoo-cho-tee.

H

Hail, (sleet)—Ma-rook-too.

Hair—In-oo-ee-ya, Nee-akko.

Long hair—In-oo-ee-yukka angee-yo.

Short hair—Nee-ak-kal-eeto.

To ruffle the hair—Mak-sook-too

Locks of hair—Noo-tin.

Half—Ah-wig-loo.

Halibut—Nat-tar-nung.

Hammer—Gra-tchee-ya.

To hammer—Kassoo-ak-too.

Hand—Oor-gut, Ah-ka-kap.

Right handed—Ter rook-pee.

Left handed—Sow-mee rool-ah.

Hand bag—Ak-ka-ban.

Handkerchief—Il-luk-loo-a.

Hand-saw—Tid-lo.

Happy—Arp.

Hard, (not soft)—Tiss-ee-yo.

Very hard—Tisshi-yoo-ar-lo.

Hard, (difficult)—Ak-soo-roor-in.

Hare—Oo-ka-duk.

Harnessing dogs (are)—Kai-men an-no-ring-men.

Harpoon—Now-rik-pa, Now-koon, Oo-nah.

Harpoon float—Awa-ta.

Harpoon shaft—Oo-nah.

Harpoon barb—Suk-ko.

Harpooner—See-boo-tik-sa.

Hatch, (to)—Too-keerk-too.

Haul back—Ah-mook-kan-ero.

Have, (I have)—U-wangah ruk pooma.

You have—Ibbin ruk poolit.

Have you got—Peeta-ruk-pootit.

Have only a little—Mik-keeto Koo-roo roo-min.

Hawk—Im-muk-kat-tai-lan.

He, Him, His, Her, Hers—Ooma, Oona.

He is there—Tow-ar-niaima.

Head—Nee-arko.

Headman—Kow-bak-to.

Hear—Too-suk-poo.

Heart—Oo-mun.

Heather—Kai-yook-ta.

Heavy—Wah-kud-lunga, Oko-maitchoo.

Heaven—Shin-nik-tanga.

Heel—King-mee.

Hell—Sen-na.

Here—Oo-ba.

Here it (he) is—Taima tub-ha.

He is not here—Marni taima.

Over here—Toong ar-nee.

Here they are—Oo-bow-oona.

Here, take it!—Attee.

Hiccough—Nirri-so-ark-to.

Hide, (to)—Ee-yuk-to.

High—Ee-ta.

High, (snow-clad hills)—King-ai-kah-ning eeta.

High tide—Oo-lee-to.

Hill, (mountain)—King-ai, Ping-oo-wah-lo.

Hit, (to)—Ning-ah-to.

Hit with fist—Pingi-see-mee-tan na

Hole—Ang-mai-yo.

Hole in seat of trousers—Ak-koolanga.

Make a hole here—Poo-oo-roon.

Hole in pipe mouthpiece—Pootoo-ee-yoo.

To stop up hole in igloo—Silliyak-kak-to.

Home, (I am going) — An-nia gah-mee luk pooma.

Hood, (to cover head with)—Nahsak-too.

To uncover head — Naz-zai aktoo.

Horn of narwhal—Too-gar.

Horn of deer—Nag-sook-

Horse—Kai-mook-shoo.

Hot—Oh-ko.

Hot water—Oo-mikt-see-o.

Hour—Ee-kark-to.

House, (tent)—Too-pik.

House of pleasure—Ag-zee-o.

Snow house—Ig-loo.

Howl — Meer-gohk-tchoo, Kee-ai-yo.

How many — Kat-seeni, Im-manani.

How much—Kish-ooma.

Hundred—Koli-koli.

Hungry—Kark-poo.

I am hungry—Karoo sak ya pooma.

I am very hungry — Kark-poo yoo aroo.

Bye-and-bye I would like to eat—Wah-tchero kark pooma.

Hunt—Koo-kirri-arg-to.

To hunt seal—Azzi-wak-to.

To hunt game—Turrik-shoo-too.

Hurry up, (be quick)—Soo-kelli.

Hurt, (to)—Arri-nook-too.

Sore—Kai-mud-loo-ar.

Husband—Ween.

I

I, (me)—U-wang-ah, U-win-nee.

I am, (I have)—Ruk pooma.

Ice—See-ko.

Ice crack—Koog-ning.

Ice-floes (pans)—Kee-lai-yo.
Ice-hole—Man-ni lark to-arlo.
Piece of ice—Nee-lah.
Rough, crumpled ice—Man-illa.
Young ice—Seeko-ar.
Ice-berg—Ag-gai-yook.
Fresh water berg—Pik-ka rooiyuk.
Igloo (a good igloo)—Igloo tub-ha.
Old, abandoned igloo — Igloo-eeya.
From my igloo—Oo-wit-tin-nee.
From my igloo to the left — Sowmee tlin-ni.
From my igloo on the right—Teeluk-pee tlin-ni.
From my igloo back there—Toonood look-pah-nee.
From my igloo in front—Sed-look pah-nee.
In, (inside)—Illoo-a, Illoo-ani.
In a short while, soon—Soo-kaitook-aroo.
India, (rubber)—Pee-ee-ya-singa.
Inhale—Nee-ook-troo.
Ink—Mee-zook-terra.
Inland—Noo-na-win, Illi-ar-loo.
Insteps, (white leather)—Dad-lua.
Intestines.—In-nar-lo.
Iron—Sowee rai-yah.
Island—Kai-jook-ta.
It is so—Ak-sook Ak-soo-ee-la.
It is not so.—Ak-soom-an-eeto.

J

Jealous—Sing-neh-ya.
Jump, (to)—Mee-sik-too.

K

Kayak, (to handle kayak)—Kayak took-too.
Keep, (to)—Pee- ara.
I will keep it—U-wang-ah-peevara.
You keep it—Ibbin peeta ree-go.
Kelso,—Kai-yuk-tsua.
Kettle—Oo-na setti.
Keys—Palla-rata.
Kick, (to)—Ai-yak-piggin.
To kick a man—Issin-mik-puggin, An-nuk-piggin.
Kill, (to)—Ka-pee-war.
Kiss, (to)—Koo-mik-ta.
Knee—Seer-ko, Seer-ko-ga.
Knee, (cap)—Sheer-ko.
Kneel, (to)—Seer-kook.
Knife, (large)—Sow-ee, Pah-nee.
Pocket knife—Pok-tee-o, Oo-ka-ruk-too.
Women's scraping knife—Ood-la.
Table knife—Pap-koo-a.
Sticking knife—Pa-tik-too.
Knife sharpener, (steel)—Ee-pikchow.
Knitting needle, (ivory)—Nikkee-tow.
Knock, (to) — Tig-look-too. Tig-look-para.
Know, (to)—Kah-yee-meh-yo.
I know—Kah-yee-boo-ga.
I do not know — Soo-gah-mee, Na-loo-booma.
You do not know—Na-loo-wahga vin.
Soon I shall know—U-wang-ah Kah-yee-niak, pooma wah-tchero
Soon you or he will know—Kahyee niak pooti wah-tchero.
Not to know — Na-loo-ee-yoo, Kah-yee-mung-ecto.

L

Ladder—Too-mukka.
Lake—Tezzuk.
To form a lake—Telli-zuk-too.
Lame, (to limp)—Too-see-ak-too.
Lamp—Kood-la.
Land—Noona.
Dirty land—Noon-em pow.
On land—Noo-na-mi.
Lantern—Kood-la.
Lapland Longspur—Shoo-gloon
Lark—T o-til-lik.
Last night—Ee-puk-tcha.
Last year—Ah-kar-nee.
Late, (to be late)—Kai-niak-too.
Laugh—Eeglark-too-Ig-gli.
Lazy — San-nung-eeto, Nuk-kung eh-yo.
Lead, (metal)—Ar-kik-sa.
Leak—Ko-took-too.
Lean on, (to)—Ai-ya-puk-too.
Learn, (to)—Tanna-oo-wi-toon.
Left-handed—Sowmee roolah.
Leg—Nee-yo
Lemming—Awig-nung.
Let Letter—Chee-chu a.
Lick, (to)—Al-look-took-loonga.
Lie, (deceive)—Tag-loo-ee-yoo.
Don't lie—Tag-looti na-mee.
Lie down, (to)—Nallai-yo.
Lie down (imper) — Kai-tooliyooma.
Lift, (to)—Tee-go-wara.
Lift, (pick up)—Kee-wik-para.
Light, (haired)—Kai-yoo.
Light, (daylight)—Ao-mai-yo.

Light, (of fire or match)—Ik-kooma
Light, (weight)—Oh-keetoo.
very light—Oh-kee-tikki-loo.
Like, love, (to)—Pee-yooi-yoo, Al-lee-ana.
I like—U-wangah peeta-ree-largo—U-wangah al-lee-ana.
I don't like—U-wangah ak-kar larga.—Pee-yoo na-mee. — Pee-yoo-wik-too.
You like—Ihbin peel-yargo.
He likes—Ooma ee-lar.
He does not like — Ooma pee yoong ma ee-larga.
I like you — Pee-yoo ma oo Pee-tark lunga.
I don't like you—Pee-yoo mung nee yoonga.
He likes me — U-wangah ooma ee-lar.
He does not like me—U-wangah pee yoong ma ee-larga.
Listen—Too-suk-poo.
Little, small—Mik-keeto. Lakeeto. Tai-shoo-mah-nee.
Very little—Mikki-tookoo-loo.
Little bag, (pouch)—Poo-chee.
Liver—Tingo.
Long—Takeeyo.
Very long—Takeeyoo-arlo.
How long—Kanook-too pah-loon
Long time—Ik-tah.
Long time ago—Ik-tar-la.
Look—Peerk-too, Tak-ko.
I go to look—Tak-ko lunga leeto.
You go and look—Takki loo-a.
Look for (seek) — Kai-muk-to, Sheerk-too.
I look for—Kai-nuk-poonga.
You look for—Kai-nuk-pootit.
He looks for—Kai-nuk ooma.
They look for—Kai-nuk ook-wa.
What are you looking for? — Kisshoo sheerk-pin.
Look out, (to)—Pee-rook.
Look out (imper)—Peeri.
Looking-glass—Tar-kark-ta.
Loon—Kok-soak.
Loose, (slack)—Ka-shooga.
Louse—Koo-mung.
Lice—Koo-mung-min.
Low tide—Tin-nee-to.
Lyon's Gulf—Ak-sung-nung.

M

Maggot—Kee-te rod-lee.
Maiden—Nibbi-ark-cha wee-nung.
Make—Shan-neyo
I make—Shan-booma.
You make—Shan-na pootit.
He makes—Ooma shan-neyo.
Male—Azzi-kai.
Small male—Noo-tar-ak.
Man—Ang-oot, Azzi-kai.
I am a man—Ang-ootea booma.
Bad man—Kah-loon ai-yoo.
Many—Am-mi-sh
How many—Kat-seeni.
Very many—Am-mi-shoo-aroo.
Map—Noo-neng-wa.
Matches—Ikki-tee, Ikkoo-mah-ni.
A match (light)—Ik-koo ma.
This kind of match—Id-low-ee-tow-iya.
Box of matches—Ik-kooma poori.
Match-box — Ik-kooma tik-koo vin.
Give me a match, friend—Ikki-tee ma booma, ee-ling-nee.
Matter, (what is the matter) — Kan-nai-pee
What is the matter with you — Kan-nai-pee wee yow.
Me—U-wang-ah.
Meat—Mer-kai.
Medecine man, (conjuror)—Anga-kok.
Mend, (sew)—Meerk-suk-too.
Men, (red)—Ow-bor-rook-ta.
Men, (white) — Kat-tung-ai-yoo, kar-blooma..
Mid-day, (noon)—Kuk-kah-nee.
Milk—Im-mo.
To drink milk—Im-minga.
Milky way, (the)—Ah-wig-noon.
Mind, (never mind)—Koo-ee-yan-na.
Minutes—OO-ee-wak-tanga.
Mirror—Ta-ra-toon.
Mittens—Poo-ah-lo.
Moffet Bay—Ik-pee-keet .
Money—Kee-now-iya.
Moon—Tuk-kuk.
Full moon—Ooma ruk-see-o.
More—At-tee-loo.
Morning—Soo-koo-neh.
To-morrow morning — Ood-lah, Oo-blar-ko.
Mosquito—Keek-toor-ia.
Moss, (edible)—Neerng-na.
Moth—Seed-lah.
Mother—A-ma-ma, Ar-ren-ar.
Mother to son—Eerg-ninga.
Mother to daughter—Pa-ninga.
Mother-in-law—Sak-keenga.
Mouldy—Oo-ko-wah-lo.
To be mouldy—Oo-kook-too.
Mountain—King-oi.

Big, rocky hills, bare of snow — Ping-oo-wah-lo.
Moustache—Oo-mee-ka.
Mouth—Kah-na.
Mouth organ—Soo-poo-kan.
Move—Ow-leya.
Much—Am-mi-shoot, Oo-nuk-toon
☞ How much—Kish-ooma.
Muff—Kai-pee-ga.
Muscular—Ta-keela rak soo-wa.
Mushrooms—At-toong-ow-iya.
Musk-ox—Oo-ming-mak.
My, (mine)—Oo-win-neh.
My God! What has happened?—Kah-nooi-too-ar-loo-in.

N

Narrow, (very, too) — Nirro-kee-took-aroo.
Nail—Ki-keeya.
Finger nail—Koo-kee-yoo.
Name, (word)—Oo-kuk-poo.
Name, (call, to)—At-tinga.
What is your name?—Kee-nar-win-at-tinga. Ibbin kee-nar-win, Ke -nar-wid-li.
What is his (its) name—Kee-now oona.
Narwhal—Yoo-nik, Kai-ya loo-ga.
Good place for narwhal—Kai-ya-loo gah-loo-in.
Narwhal horn—Too-gar.
Near — Ka - nik - tuk - aroo, Kree-moosi.
Neck—Koong-ai-sah, Nee-oh-luk.
Back of neck—Toona-shook.
Short-necked — Neeyo-la-keeto. Koongai-see-kee-to.
Neckerchief—King-ai-son.
Needle—Meer-koon.
Needle, (case)—Kak-ee-yin.
Nephew—O-goo-go-ga.
Nest—Ee-yai-yo.
Net—Ma-tee-ta.
Never mind—Koo-ee-yanna.
New—Ak-too-ee-too. Ma-kuk-too.
Next year—Ah-kar-go.
Niece—A-goo-go-ga.
Night—Ood-noo-a.
Last night—Ood-lah.
To-night—Ood-noo.
Nine—Tisshi-maring.
Nine o'clock—Ka-pee-yia.
Nineteen—Tisshi- eerk-poon.
No—Ark-kah, Nark-kah.
No, (emphat)—Ark-kah-leeya.
Noise, (to make a)—Ah-yil-la-wah-look-to.
Noon, mid-day—Ood-loo-ruk-poo.
None,(there is)—Ark-koom, Nung-ook-poo.
There are none—Peeta-rang-nee-la.
North—Ik-ki-yung.
From the north—Oo-nung-ung.
To the north—Oo-noonga.
Nose—King- a.
To rub noses—Koon-igloo.
Nose, (shield)—King-ai-lee-suk.
Nostrils—Soor-gloo-mi .
Not—Mah-mi, nah-mee, na-ow.
Not here—Mah-ni tub-ha, Na-ow.
Not there—Mah-ni, tai-ma.
Nothing—Noo-ook-poo.
Zero—Ang-mai-yo.
Now, (immediately)—Too-ar-wik-too, Too-ar-wad-linga.

O

Oars—Ip-poon.
Oatmeal—Ar-rek-tee-ya.
O'clock—
5 o'clock—Ted-li-ming-an.
6 o'clock—Ak-pin-nin -an.
7 o'clock—Ak-bin- ing ai-pa.
8 o'clock—Pinga-shoo-an.
9 o'clock—Ka-pee-yia.
10 o'clock—Koli.
11 o'clock—Shin-ning-an.
12 o'clock—Koli-lo-ah-gan.
Old—Itto-ko-ark-sah.
One—At-tow-son.
Open—Ig-lee.
Open the door—Mat-too ig-lee.
Other, (others)—Ai-pungi.
Out, (outside)—See-la-tah, Seed-la
Overland, (to go)—(Ka-moo-tik) noona wee-ar-lo.
Over there—Oonga ta-ni.

P

Pack, (to pack on shoulders) — Mow-muk-too.
Paddle, (to)—Powk-too.
Pail—Kut-tang.
Paint—A-ming-goon.
To paint—A-ming-wa-roon.
Pancake—Sah-too-ee-ya.
To make pancakes—A-koo-tee-o.
Pannikin—Ig-noo-see-ya.
Pants—San-nai-yan, Koo-ga-roo.
Paper—Pai-pa-jin allee-lai-yo.
Toilet paper—Eer-kow-tik.
Give me paper—Kai-choo teer-tuk-to yah vee sah-ming.
Patch, (to)—Poo-jook-too.
To patch shoes—Izzi-kan poo-jook-too-aroo.

Patricia River—T kki-rah-ruk-tua

Pay, (give. to)—Kai-jo.

Peat—Man-na.

Pegs, (tent)—Pow-oo-war.

Pen—Tee-took-too yown.

Pencil—Tee-sootee-yown, Tee'suk. too-iya.

To sharpen pencil — Noo-l ok-shak-tunga.

Penis—Oo-soo-ga.

People—In-yoo-in, Yak.

Petticoat (short)—Ang-ee-yook-ta

Photograph—Ai-pug-oo-wah.

Pick up, (to)—Teego-wara.

Picture (give me)—Kum-mik poo rd lung .

Pillow—Ar-kee-sa.

Pin—Kee-kee-ya.

Pipe — Shee-book-toon, Kee-yoo, Poo-yoo-rit-tee-o, Pee-yoo-er-rit (igloolik).

Pipe made of soapstone—O-koo-zi -sah.

Pipe cover—Mat-too wah-taima.

To smole a pipe—Kee-yoo shee-book-toon.

To clean a pipe—Al-larto, pah-ow-suk-pah.

To light a pipe—Ow-ma-ree-to, Shee-book-toon-ee-kee-wee-tin.

To fill pipe with tobacco—Mow-muk-too, Oo-wik-see-o il looli keeto.

Pitch, to (like a ship)—Poo-kak tuk.

Pitch tent, (to)—Pee-tuk- oo-goo.

Place, (suffix)—Lik, tsua.

Example — Oo-miak-tsua, Ig oo-ik.

What place ? — Nan-ni noo-na kow-pee ?

Plate—Oo-tig-gan-ee-a Ow-see- ah (Ig oo ik)

Play, (to)—Pirra-rek-too.

To stop playing—Pirra-rek-town nerrin.

To play cards—Marri-tak-too.

To play lance and ball—Nood-ook-tak-to.

Plenty—Am-mi-shoot, Tai-tak-to, Oo-nook-toon.

Plower—Too-ee-too-ee.

Golden Plover—Sow-kwa.

Pocket (women's trousers)—Ow-wad-oo.

Pocket knife—Pok-tee-yo.

Point of land—Noo-wah-da.

Pole (wooden)—Kah-nung.

Pond's Inlet—Ee-yuk-tsua.

Poor—Mikki too-koo-roo.

Pot, (large boiler)—Oo-koo-si, Kut-tah.

Small earthern pot—Yar-kar.

Potatoes—Tat-tee.

Pour water, (to)—Koo-ee-see-yoo.

Pregnant—Nark-to.

Pretty—Kun-nuk-too.

Pretty woman—Ah-na kun-nuk-too.

Promise, (to)—Shoo-mee soo-pah, Takko shai-ya.

Prospect, (to)—Oo-ee-yah-tuk.

Prospector — Oo-ee-yah-yook-tar-tee.

Ptarmigan—Ark-kigogi-an.

Pull, (to)—Noo-sook-pah, Nooi-yark-tinga.—Noo-sook-tinga.

To pull tight—Ak-sah-rook-too.

Pupil of eye—Takko nat-tee.

Push, (shove. to)—Ai-yuk-tinga, Ai-yok- uggin-ai.

Push in (to)—Ai-yiggi-yaroo.

Put down, (to lay a thing down)—I - ee-vara.

Put a hole here—Poo-oo-roon.

Put on, (to)—Kard- ik-too.

Put shirt on—At-tee-yee-yo.

Put hood over head — Nah-sak-too.

Put on a woman's leggings—Ka-mik-too.

Putrid, (rotten)—Ee-go-nuk.

Very putrid—Ee-go-nuk-to -aroo

Q

Quick—Soo-kelli.

Very quick—Soo-kai-yoo-arlo.

Quiet—Kai-kiak-too.

R

Rabbit—Oo-ka-duk.

Rack for drying clothes — In-nee-tah.

Rain—Ma-kuk-too.

To rain heavily—Ma-kook-klooni loo.

Ramrod—Parm-wee-yown.

Rat (lemming)—A-wig-nung.

Razor—Oong-ee-yown.

Read, (to)—Kai-mik-ko-ark-too

Red—Ow-bor-rook-ta.

Red haired—Ow-bor-rook-ta.

Reindeer—Took- o .

Reindeer moss—Neerng-na.

Remain, (to) — Kai-tar-to, Keh-yak-to.

Remain to day—Oo-gloo-mi Keh-yak-to.

Remember—Ee-ah-kuk-para.
Repulse Bay—O-ko-zik-soo-a.
Rich—Oo-nook-too-ar- oo-ee.
Right, (good)—Tub-ha.
All right—Ik-karo.
That's right—Ig-nai-iya.
Ring, (for finger) — Na-goo- rni, Metti-lee-ar-ga-go (Iglooli).
Rip, (tear)—Ang-mak-too.
River—Koo.
Big River (in flood)—Koo-gar-lo,
Rock—Oo-wee-ya.
Rocks—Oo-wee-yagga-oo-yo.
Solid rock—Ig-nard-o.
Large rocks—Ig-nar-lo.
Roll (like a ship), to—Nangi-ark-to
Root—Ok-pee-gah.
Edible roots—Koong-oo- ee, Aira.
Rotten—Ee-goo-nuk.
Very rotten — Ee-goo-nuk-too-arow.
Rough (water, sea)—Ing-i-yoo-lee-too.
Round—Ag-ma-rook-too.
To turn round—Sang-oo-man-na.
Rub—Koo-mi- ak-to.
To Rub noses—Koon-igloo.
Rubber—Pee-ee-yah-singa.
Ruffle the hair, (to)—Mak-sook-too.
Run — Oo-gah-look-too, Ood-li-ook-too.
To run fast Pung-ar-rik-to.
To run slow—Pee-yook-too.

S

Sack—Nar-poon.
Knapsack—Poo-koo-mal-oo.
Sail, (to)—Im-mow-win-uk-too.
Sail of ship—Tingi-kowta.
Sail of small boat—Na-pa-ra-ton.
Salmon—Eer-kud-do.
Place of salmon—Eer-kud-loo-in.
Salmon trap—Sar-poo-ting.
Salmon River, (Ponds Inlet) — Ki -lah-loo-kan.
Salt—Turree-yo.
Salt water—Im-mik-turree-yo.
Same, (the same as)—Tai-mar-too, Ad-jing...
Sand—See-ook-ah, See-oo-gai-yah.
Sand fly—Kee-tooria.
Satchel—Po-kah-mirro.
Saucer—Ta-ma-rai-koon.
Saw—Tidd-lo, Kig-gloo.
Say, (to)—O-kar-lee.
I say—U-wangah o-kai-yo.
You say—Ibbin O-kar-lee.
He says—Oona o kar-lee.
What does he say,—Shee-bo-go.
Scheming river—Seerng-ming.
Scissors—Kibbi-ow-tir.
Scott's Inlet—Ow-ning.
Scrape, (to)—Tassi-yook-too.
Tin scraper—Tai-yook-kan.
Sea—Im-mee-arlo.
Calm sea—Ook-soo-ark-too.
Rough sea (waves)—In-yoo-lio ang-ee-yo.
To go to sea—Im-mow-wee-arlo, Im-mow-win-uk-to.
Seal—Nit-ti-ek.
Big, square-flipper. Seal—Oog-jook.
Bladder-nose Seal—Ap-pah.
Young Seal—Nit-tia.
To hunt seal—Azzi-wah to. Poo-see-moon.
Sealskin—Kisshin.
Unbleached sealskin—Ak-too-oo-mah.
Bleached sealskin—Is-sheeka.
Bleached seal insteps—Dad-lua.
Seal beef—Nar-kum-ming.
Seal blubber—Ook-sook.
Seal boots—Kam-ming.
Seal breeches (hair utside)—Nitto kotee.
Sealskin canoe—Ko-took-sa-eer, Kayak.
Seal Insteps (fancy work —Keep-too-ser-ar-ning.
Sealskin mittens—Yee-kar-tin.
Seal rope—Ak-kloo-nab.
Seal rope for harpoon—Ak-s o-nah
Seal rope for narwhal harpoon—Ard-look.
Seal shoes (low)—Izzi-kan.
Seal shoes with fur leg—Nee-yoo-gah-geeya, Kanik-pa.
Sealskin slippers (fur inside) — Izzi-gow-yen.
Sealskin slipper (unlines)... izz ya-goten.
Seal socks (short hair outside) — ee-nah-ran.
Seal stove—Kood-lin.
Seal or caribou sinew—Sing-ha.
Sealskin (transparent) window — Igloo-peer-ko.
Seal whip for dogs—Pa-ra-oota.
Sea Toad—Kan-nai-yo.
See, (to)—Tak-ko.
I don't see—Tak-ko nah-mee.
See, (look, imper)—Tak-ko, Peer-koo.
Not to see in the dark—Tar-ma rah-ma.

Seek, (look for, to)—Kai-nuk-to, Sheerk-to.
Sell, (to)—Pood-latti.
Send, (t)—At-tirri-nuk-suk-in.
Seven—Mar-koning.
Seventeen—Mar-lah-koli.
Sew, (to)—Meerk-sook-too.
Shadow—Tar-kunga.
Shake, (to) — Iz-zook-tanna-eet-kunga.
Shake with palsy, (to)—Oo-too-wee.
Shallow—Eer-ka-too-karoo.
Sharpen pencil, (to)—Noo-book-shak-tunga.
Sharp—Ee-pik-tchoo.
Shave, (to)—Oong-ee-yar -too.
Shinbone—Kun-nar.
Ship—Oo-miak-sa.
  Ship in sight off point—Noo-wadla sarg-arni.
  Ship rolls—Oo-ai-yoo.
  Ship pitches—Poo-kak-tak-too.
Shirt—Man-noo, An-noo-ar-jikka.
  Deerskin shirt—At-tee-gee. Ah-tee-ah.
Shoes—Kamming.
Shoot, (to) — Koo-kerri-ark-to, Koo-koo-ee-yoo-ning Sar-koo-too (Igloolik).
Short—Nait-to.
  Too (very) short—Nai-took-aroo
Short time, (soon) — Tai-shoo-mah-nee.
Short time ago—Im-mitti-ak-aroo
Short wool, (fur or hair)—Seerk-gar.
Shoulder—Too-ee-ga.
Shove, (push, to)—Ai-yuk-tinga, Ai-yak-luggin-ai.
Shovel—Kaid-loo-own, Poo-ar-kin (Ingloolik).
Shut, (to)—Oo-mee-yak-poo.
  Shut the door (imper)—Oo-mig-li
Sick—Na-ah.
Side, (the other side)—Akki-aning.
  On this side—Noo-now-ow.
Silent island,(Scott inlet)—In-ar-loo-ard-joo.
Silver, (white metal)—Kowd-look-tan.
Sing, (to)—Ing-niuk-too, K g-gee-yo, Ingi-yoo-moo .
Singlet, (woolen)—Oo-win-ne -go.
Sister—Ney-yah.
  Sisters—Nookah.
  Sisters call each other—An-ninga.
  Sister call brother—Nee-yunga.
Sit (to)—An-nuk-toon.
Sit down, (to)—In-nee-to.
Six—Ak-bin-nik-poo.
Sixteen—Sun-ni Kalek-poo.
Skin—Koo-jik-ta! ai-singa.
  To remove the skin—Ark-tinga.
  To skin—Eer- ik-too.
  Skin of deer—Am-mil.
  To skin a deer — Took-too too-koo-ee-aroo.
  To skin a seal—Nit-ti-ek too-koo-ee-aroo.
  To skin a fox — Terri-ga-neeya too-koo-ee-aroo.
Skin stretchers, (pincers)—Kee-see-titti-yoo-tee.
Sky—Nooi-ya.
  Clear sky—See-luk-kuk-too.
Slack, (loose)—Ka-shoo-ga
Sleep, (to)—Shin-nik-poo.
  You sleep with me—Toot-igloo, Tooti larg lung ai.
  I sleep—Shin-nik poonga.
  You sleep—Shin-nik pin.
Sleeping-bag—Poh-o .
Sleeping rug—Ma-minga.
Sleepy—Ney-y n-uk-too.
Sleeve—Ai-ra.
Sleigh—Ka-moo-tik.
  The sleigh rolls—Oo-wai-yoo.
  The sleigh pitches—Poo-kak-tak-too.
Slip, (to)—Too-noo-ard-look-too.
Slip up (to)—Issi-wad-luk-too.
Slow — Kak-too-ai-yoo, Kai-toon-ag-gin.
Small—Mik-keeto, Lak-keeto.
  Very (too) small—Mikki-too-koo loo.
Smear, (to)—Am-min -wa-roon.
Smell, (to)—Ma-muk-too.
  To smell strong—Ma-muk-too-arlo.
  Bad smel (stink)—Tippi-lee-gara
Smoke—Iz-zee Kai-yo.
  To smoke a pipe—Shee-book-too.
Smooth the hair, (to) — Nillar-mai-yoo.
Snake—Nee-meeri-ak.
Sneeze, (to)—Tarri-uk-to .
Snipe (to)—Neer-sik-too.
Snow—Ap-poot.
  Soft snow—An-yo.
  To snow—Kan-nuk-too.
  Snow is falling—Kan-ning.
  To fall in the snow—OO-kee-o.
Snow-blind—Id-look- oonga.
  To be snow-blind — Id-loo-lik-pooma.
Snow goggles—Ig-gar.
  You make snow-goggles for me—

Ig-gar-ning shan-nin-nee ark pooti.
Snow-hut—Igloo.
Snow-knife—Sow-wee, Pah-nee.
So—Ya-mah-no.
Soap—Wash-ow.
Soapstone rock—O-koo-sik-san.
Socks woollen—Ee-nikki.
Socks, (deer or seal)—Pee-nah-ran.
Long deer socks (hair inside) — Al-look-see.
Long outer deer socks (hair outside)—Meer-ko-leen.
To dry socks—Oo-koo ee-nikki.
Soft—Ah-rit-too, Ard-lari.
Son—Noo-ko-pia.
Son calls mother—Eer-ninga.
Son calls father—Ah-ri-nunga.
Son-in-law—Ni g-owga.
Song—Ing-nee-ran.
Soon—Soo-kai-took-aroo.
Sore—Kai-mud-loo-a.
Sorrel—O-kah-wee-ya.
Soul—Tar-ninga.
Sound, (fiord)—Kai-ni-oo-kloo.
To go to the sound—Kangi-wak-too.
Sour—Ai-ee-tar.
South—Pah-nee.
From the south—Pahng-ung.
To the south—Powng-a.
Speak, (to) — O-kard-lik-to, O-kark-to.
Speak (imper)—O-kar-ee.
Don't speak—O-kar-ee nah-mee.
I speak—U-wangah o-kark-to.
You speak—Ibbin o-kard-lik-to.
He speaks (says)—Ooma o-kow-tee nia ruk para.—Ooma o-kar-ee
Sqirit—Tar-ninga.
Split, (to)—Oo-ee-arto.
Spoon—Al-loon.
Square—Kip-pa-reeto.
Stab me, (exclamation)—Kah-pen na-mee.
Stalk game, (to)—Turrik-shoo-too
Stand erect, (to)—Ma-kik-pe.
Stand up (to)—Man-nook-to.
Stars—Oo-gloo-ria.
Start on journey, (to)—In-nar-kai-yo.
Steal (to)—Tee-gleek-to.
Steam — See-luk-kut-to, Ikkoo malli.
Steep shore—Ko-tai-too.
Steer with wheel (to)—Ark-koo-too
Steering wheel—Arko-oon.
Stick (of wood)—Kee-yoo-wak-ka-duk.
Stick for lighting pipe—Tak-koon.
Stick, (upright) in drying rack—Soo-ka-ree-ya.
Stick, (horizontal) drying rack—Pow-oo-sah.
Stick with a knife, (to)—Pa-tik-too
Sting—Tee-toi-ya.
Stink—Tippi-lee-gara.
To stink—Nai-yo.
Stockings—Ar-rut-see.
Stomach—Suk-hara, Nad-jeer-ka.
Stone—Oo-ee-yagga.
Many stones—Oo-ya-rud-da.
Sharpening stone—Izzi-kah-kap.
To prospect stones — Oo-ee-yar-tuk.
Prospector—Oo-ee-ya yook-tar-tee.
To throw stones—Na-ka-takto.
Stoop, bend down,(to)—Oo-koo-go
Stop—Noo-ka-ga-lee-gee.
Stop at, (remain, to)—Kai-tar-to.
Straight—Tru-ak-to, Too-kee-lee-ak-to.
Strathcona Sound—Ab-bark-to.
Stretch, (skins) to—Ig-nia.
Stretch, (yawn) to—Tazzi-suk-to.
Strike,(to)—Pingi-see-mee-tanna.
String—Ak-soo.
String to tie boots at knee — Ooma rotee.
String to tie round waist—Tirrik-see-yo.
Strong—Sug-nee-yo.
Stupid (sleepy)—Ney-yan-uk-too.
Suck, (to)—Mee-look-loo-goo.
To suckle child—Am-ma muk-too
Summer—Ow-iya.
Sun — Seer-kun-nuk. — Seer-kun-yung—Noo-wee-ai-yoo.
Small (young) sun—Mah-koo-too
Sun up day and night—Tig-kee-toon.
Sun high (over head)—Ood-loo ruk-poo.
Sun rise (down)—Nooi-luk-too.
Sundown—Nee-pee-yoo.
Sunset — Ik pukki too-koo-roo rook-too.
Sun at zenith (mid-day)—Koo-kah-nee.
Sure, (certainly)—Ah-mee-lah.
Swan—Tat-ti kak-tooa.
Sweat—Sar-to.
To sweat—Ki-ak-teeto sar-to.
Sweater—Oo-win-nee-go.
Sweet—Seer-mik-too.
Swim—Oong-wai-yo.

T

Tangle, (to)—Nee-gah-week-too.

Tar—Tar-la.
Tent—Too-pik.
Tent pegs—Pow-oo-wah.
To put pegs roud tent—Pow-oo-wah-loo-goo.
To pitch tent—Pee-tuk-loo-goo.
Tern, (Arctic) — Ak-pah, See-ar-week.
Thank you—Koo-ee-yoo-an-amik, Narko pootit.
Thank you very much—Koo-ee-yoo kowt-lee lah-goona.
That—Tai-ka.
That one there—Taima mah-ni.
Them—Ooma pingin.
All of them—Ook-wa, Muk-kwa.
There — Taima, Mowna, Ooba taima.
He (it) is there—Tow-ar-ni taima
He (it) is not there—Mah-ni taima, Na-owk.
I am going there — Ik-kar-ni taima.
They—Ook-kwa, Muk-kwa.
Thigh—Kak-too-aroon. Kok-tooga
Thimble—Teeka. Tee-Keera,
Thin—Sal-look-troo.
Think—Sa-oona.
Thirsty—Im-ma ruk poo.
I am thirsty—Im-ma lee ruk pooma.
Are you thirsty—Im-ma lee ruk pootit.
Thirteen—Pingi-shooning.
This—Tub-ba, ooba.
On this side—Noo-now-ow.
Those present—In-nooi.
Thread—Ee-vel-lo.
Three—Pinga-shoot.
Throat—Toork-lo.
Throw stones, (to)—Na-ka-tak-to Mel-loori-ak-to.
Throw away, (to)—Eed-lug-go.
I throw away—U-wangah-eed-lug-go.
You throw away—Ibbin ee-geet-cho.
He throws away—Ooma ee- geet-cho.
They throw away—Ookwa ee-geet-chin.
Thomb—Kood-loo-a.
Thump (knock)—Tig-look-too.
Tickle, (to)—Koo-niak-sak-too.
Tide—Tag-ya-ruk-too.
High tide—OO-lee-to
Low tide—Tin-neeto.
Tie (make fast,) to—Kill-yeh-go-Nar-kit-tar-eh-yo.
Time—Ook-wa.
What is the time ?—Nomoon ook-wa.
A short time ago—Mowna ka-neet too-koon.
A long time ago — Ik-ta-roo ik-tah.
A very long time — Mikki too-koo-loo-een.
Tin—Koo-sook-sia.
Tin cup, (pamikin)—Ig-noo-sia.
Tired—Tah-kai-yo, Hoo-ee-yoo.
Tobacco—Tab-bak, Ow-wik-see-o.
Chewing tobacco — Ta-bakka-mee.
To cut tobacco—Ow-wik-see-o see-ar-glo.
To fill pipe—Il-looli-keeto.
Tobacco pouch—Tah-bakka-sha.
Toes—See-bo-ningi.
Big toe—Poo-tooi-yak-poo.
To move the toes—Oo-jikka kai-yook-tar-too.
To-day—Ood-loomi.
Tomorrow—Kowk-pen.
Tomorrow morning—Oo-blark-o
Tomorrow, early—Kow-luk-pen
Too much—Tar-ret-too, Am-mi shoot.—Ar-ri-etti took-too (Igloolik).
Tonga Sound—Koong-ig-lar-lo.
Tongue—O-kah.
To-night—Ood-noo.
Top, (on top, up above)—Kar-sun.
Torn—Ang-mai-yoo.
Touch—Ak-took-too.
Towel—Al-lar-go.
Tremblay Sound—Kang-ak-tloo.
Trowsers—Kah-gleep, Koo-ga-roo.
Truth, to tell the—Sug-gloo-neek-too.
Tumble, (fall, to)—Ig-joo-allo-min
Turf, (peat)—Man-na.
Turn round, (to)—Sarng-oo-iyoo.
Tusks,(Walrus or Narwhal)—Too-gar.
To pull out tusks—Nah-zook-para, Kee-luk-para.
Twenty—In-yooig-nah-yo.
Twist, (to)—Kid-sak-luk-see-mai-yoo.
Two—Mar-kow.

U

Ugly—Pee-yung-ee-to
Very ugly—Pee-yung-ee-to-arlo.
Uncle—Ung-ug-ga.
Under, (below)—Ud-lin.
Understand—Kow-yee-meh-yoo.

I understand very well—U-wangah how-yee-meh-yoo-arlo.
Do not understand—Nah-loo-ee-yoo, Kow-yee-mung-ee-to.
Will understand later—Kow-yee niak pooma wah-tchero.
Unstitch, (to)—Tekki.
Up—Ko-bar-to.
Up above, (on top)—Kar-sun.
Urine—Kok-vik, It-ta-ro.
To urinate—Ko-sook-too, Ko-sook-tarri.

V

Vagina—Oog-choo, Oo-toong.
Valley—Narg-sah.
Large glacial valley—Nark-sar-to
Vegetable cotton, (for wick) — Ikko muk-too.
Very — Am-mi-shoot. — (Suffix)-Arlo, arloo-ee.
Vomit, (to)—Soong-ak-suk-too.

W

Waist string—Tirrik-see-o.
Wait, (stop at)—Keh-yak-to, Pik-see-luk-too.
Wait (stop) here to-day—Oo-gloo mi Keh-yak-too.
Wait a minute—Ah-mee-lah.
Walk, (to)—Pee-suk-too.
Walrus—Ai-vil.
Walrus tusk—Too-gar.
Want, (I want)—Mee-taima.
I want one — At-towson mee taima.—At-towson yoong ma oo ma.
I don't want one—U-wangah at-towson narka.
Not to want — Nee yoong ma ooma.
I want a match — Ik-kooma attowson.
What do you want ?—Soolee ard loo-tee.
Warm—Okoh Oo-muk-too.
To warm socks—Okoh ee-nikki.
Warm water—Oo-nukt-see-o.
Wash, (to)—Eer-mee-too.
To wash dishes—Wash-ook-too.
You wash the dishes—Wah-sak-too.
Watch, (timepiece) — Koo-ming, Sug-ug-noi-yook. — Kow-ee-sah (Igloolik).
To watch—Takko.
Watch him—Takkoo-eetoona.
Water—Im-mik.
Fresh water—Im-mug-lo.
Salt water—Turr-ee-o.
Cold water—Nig-gli-nuk-too.
Hot water—Oo-nukt-see-o.
Deep water—Itti yoo ar-lo.
Shallow water—Ik-ka too-koo-loo
Fresh water iceberg—Pikka-rooi-yuk.
In the water—Im-ah-mi.
Give me the water—Im-ma lowg lunga.
To pour water—Koo-ee-see-yoo.
Waves—In-yoo-lin.
Big waves—In-yoo-lio ang-ee-yo.
We—Oo-weh.
Weak—Shug-nee-o.
Welcome—Sai-moh.
Well (in health)—Pee-roo-nee-poo.
It is well—Pee-yooi-yook, Ing-oi-ya.
West—Ow-wah-nee.
From the west—Ow-wanga.
To the west—Ow-goon-ga.
Wet—Kee-yoo-kak-too.
Whale—Ak-bin.
Whale blows or spouts—An--nuk sar-to.
Whale blubber—Muk-tuk.
Whale skin—Ook-sook.
What is it?—Hai ?
What?—Kisshoo ?
What are you looking for ?—Kisshoo sheerk-pin ?
What does he say ?—She-bo-go ?
What for (why) ?—Kan-noo-mee. too ?
What's the matter ? — Kan-nai-pee ?
What is the matter with you ? — Kan-nai-pee wee yow ?
What is the time ?—Nam-moon ak-pah ?
What is your name ?—Kee-nar-win ibbin ?
What is his name ?—Kee-now-oo na.
What do you want ? — Kisshoo-min ? Soolee ard-loo-tee ?
Wheel—Arko-oon.
When—Kan-na ? Kood-yoo ?
When do you go ?—Kan-na owd-lee nee-ar luppee ?—Kanna owd-lee lark-to.
When did you come ?—Akki-la-o ? Akki lark-poo ?
Whence, (from where ?) — Nark-kin.
Whence comes, (he) — Nark-kin oona.

Where, (what place) — Now-gli, Nan-ni noona kow-pee.

Where is it ?)—Now-li taima.

Where did you get it ?—Nam-moon ook-wa.

Where do you come from ? — Now-kin gnar-pin ?

Where does he come from ? — Now-kin-oona.

Where are you going ?—Nam-moon nar-pin ?

an-mak-ki ?

Whip, (dog whip) — Ip-pa-row-ootah.

otah.

Whistle, (to)—Oo-wig-nee-arto.

White—Kowd-luk-too, Kud-joo.

White people -- Kar-bloom-ah. Kat-tung-ai-yo.

Who—Kee-sho ? Kee-na.

Who gave it you, friend ?—Nam-moon Ook-wa, ee-ling-nee ?

Why—Kan-noo-wee-too

Wick, (made fro fibre)—Man-na.

Wick,(made of moss)—Shoo-pooti.

Widow—Oo-ee-ka-shoo.

Widower—Noo-lee-to.

Wife—Noo-lee-an.

My wife—Noo-lee-anga.

Husband calls wife—Kom-ma.

Wind—A-noo-i.

East wind—Ar-weeg-narg-nung.

West wind—Oo-warg-nung.

Window—Ig-gah-lah.

Little window—Ee-gah-langa.

Wing—Soo-loo.

Wise—Kow-ee-yoo-ni-eh-ee-yoo.

With (suffix)—lo.

With me—U-wang-ah-lo.

With you—Ib-bid-lo.

With him—Oo-nad-lo.

With them—Ook-wad-lo.

With the captain—Kap-pi-tad-lo.

Wolf—Ar-now.

Wolverene—Kappi-yark-tchoo.

Woman—Koo-nee, Ah-nah.

I am a woman—Ah-nah looka oo-weh.

Tell woman to come — Arg-na-mee kai-yoo kill-owg lillee.

Tell woman not to come — Oo-kowt - lee lao kai - yoo nee - ung-moon.

Ask why woman does not come ? —Shookin kai-yoo nee lung illa.

Wood—Kee-yo, kee-yoo-ark-tsoo.

Hard wood—Tiss-uk-ta.

Soft wood—Kai-yoo-ark-tchoo.

Wooden board—Sai-luk-ta. Koo-vee-ar-to.

Wooden stick—Kee-yoo wak-ka-duk.

Wool, (fur, hair)—Meerko, Meer-kwa.

Short wool etc—Seerk-gah.

Long wool etc—Meerko-wik-too-arlo.

Word—Tai-yoo-ee-yoo.

Work, (to)—San-nuk-suk-too.

Work—San-neh-yo.

Plenty of work—San-nuk-suk-too-arlo.

To be full of work—San-neh-yoo-arlo.

Worm, (maggot)—Kee-tee rod-lee.

Wrist—Ur-gow-tikka.

I have cold wrists—Ur-gow-tai yook pooma.

You have cold wrists—Ur-gow-tai-yook pootit.

Write, (to)—Tee-tuk-too yak-too.

Writing (n)—Tee-tuk-too-yak-ka

I write—Tee-tuk-too ya-tek-ka.

You write--Tee-tuk-too ya-tret-ti

He writes—Tee-tuk-too ya-tengi.

Writer — Tee-tooti-yook-tar-ti —

Writer — Tee-tooti-yook-tar-ti — Tee zuk-too-yarti.

Y

Yawn, (to)—Tazzi-suk-too

Yes—Ee-yee. Ak-soo.

Yes, (sure)—Eed-lah.

Yonder, (over there) — Oonga tah-ni.

You—Ib-bin.

With you—Ib-bid-lo.

Young boy or male—Noo-ta-rak.

Young girl or female—Ninni-ark-tcha.

Young seal—Nit-tia.

Young sealskin—Nit-ti-an.

Youth—Noo-ko-pia wee-nung.

VOCABULARY OF WORDS

USED BY THE

TRIBE OF INLAND ESKIMOS INHABITING THE BANKS OF KAZAN AND FERGUSON RIVERS

By J. Burr Tyrrell

Obtained from A–yout, an Eskimo living on the upper part of the Kasan River. It was largely revised at Churchill by Powow, an Eskimo from the same district, with the assistance of the Rev. Jos. Lofthouse as interpreter.

The words are given in very much the same order as in J. W. Powell's "Introduction to the Study of the Indian Languages", and with some slight modifications the sounds of the letters are the same.

The following is a list of the vowel sounds here used:—

a	as in English	fat.	o	" in English	pot.
ā	do	far.	ō	do	go.
â	do	all.	u	do	but.
e	do	met.	ū as "oo"	do	fool.
ē	do	they.	ai	do	aisle.
i	do	pin.	y	do	year.
ī	do	marine.	ou	do	out.

(1) Persons

Man—āng'-ut.
Woman—ār'-nak.
Elderley man—ō-tok'-kak.
Old woman—ār-nak-kwek-kak.
Young man—īn-nū-kūk-tūk.
Boy—nū'-kā.
Girl—nai-uk.
Infant—nū-tār'-ak.

(2) Parts of the Body

Head—nī-ak'-kuk.
Hair—nut'-tek.
Grey hair—ka'yuk.
Face—kī'-nak.
Forehead—kou.
Eye—ī'-ik.
Eyebrow—kab'-lūt.
Ear—ki-yū'-tik.
Nose—kaing'-ak.
Beard—ūm-mik.
Mouth—kan'-yek.
Teeth—kī-ūt'-ti.
Tongue—ok'-ka.
Chin—tab-lū.
Neck—kon-i-lī-ni-ak.
Body, (trunk)—ka-te-guk.
Shoulder—nī-gu-blū.
Back—kai-mer'-i-luk.
Breast—ūm'-met.
Breast bone—hak'kig'-gek.
Belly—ner-rok'-kak.
Arm—tal'-yek.
Hand—ag'-gek.
Fingers—hī-tam-ut.
Thumb—kōb'-lū.
Leg—nī-ū.
Thigh—kok-tō-ak.

Leg below the Knee—kan'-nak.
Foot—ī-ki-gek.
Toes—taip-in-in-ū-dik.
Marrow—pat'-chuk.

(3) Dress and Ornements

Hood—na'-ha.
Coat (outer deer-skin garnment)—tko'-lī'-tok.
Trimming round coat—ag'-luk.
Shirt (inner deer-skin garnment)—at-tī-yī.
Trousers—ka'-līk.
Gloves (with fingers)—ad-gui-ut.
Boots—kam'-mi.
Deer skin blanket—kaip'-puk.

(4) Dwellings, Etc.

Camp or village—ig-lō.
Tent—tō-pek.
Fire—ōk'-ka.
Flame—ek-wā-la'.
Smoke—pū-yuk.
Ashes—īm-mē-an-nī-kō.
Cache—pe-rūl-yā.
Track—tū-mī.
Iron—hā'-wik.
Copper or brass—ka-nū'-huk.
A sound—nā-ki-nim'-na.
A blow—a-nou'-yuk.
Sight—tak-kū-yuk.

(5) Implements

Bow—pid-jik'-ī.
Fishing spear—kuk'-ki-wa.
Deer spear—u-puk-tō.
Head of deer spear—ū'-lū.
Handle of deer spear—ī'-pu.
Fishing hook—kar'-ī-ō-kuk.
Fishing line of sinew—ī-pī-ū-tuk.
Stick on which line is wound—ū-led'-gūt.
Float for fishing net—puk-tak'-kut
Knife—pī'-lout.
Knife (small penknife)—o-kut'-tak
Snow knife—pan-ne'.
Pipe—pu-lu-yet'-ti.
Pipe stem—i-po-ak.
Awl (for boring)—i-kai-tak'.
Needle—mit-kut.
Canoe (for one man)—kai'-ak.
Wooden gunwale, piece of kaiak—ap-pum'-mak.
Double paddle—pou'-tik.
Boat—ūmi-ak.
Boat, white man's—Ka blū-nak-tho-ak.
Boat, large—ū-mi-ar'-yū-ak.
Sail—tin-gin-er-ou-tuk.
Sledge—kam-ōd'-jik.
Deer skin line—hī'-ni-ak.
Plaited sinew line—pīl-er-ak.
Thread—en-na-lū'-ka.
Parchment—kai'-tin-kū-ni.
Cup—īm-mo-hū'-yak.
Spoon (musk or horn)—ōu'-i-yū'-yak.
Kettle—hā-wik.
Lid of kettle—ō'-ku-ak.

(6) Food

Meat (of deer)—ū-yuk.
Dry meat—nip'-kū.
Fat—tūn'-nūk.
Boiled grain—kat'-che-wuk.

(7) Colours

Black or blue—ka-re-nek'-tō.
Red—ou-pa-luk'-tō.
White—ka-guk'-tō.

(8) Numerals

1—a-tou'-i-ak.
2—mal'-rōk.
3—ping'-a-yū-ak.
4—hī-tā'-mut.
5—ted'-li-ma.
6—ar'-wing-e-gik.
7—mal'-ung-ik.
8—ping-a-hyū-ni-ik.
9—kū-ling-gūl-u-ak-tak.
10—koul'-yik.
20—mal-rō-ad-gug'-gik.
30—ping-a-ho-ad-gu'-yik.
40—hī-tam'-ad-gu'-yik.
50—ted'-le-mat-ad-gu'-yik.
Half—nap'-puk.

(9) Divisions of time

Day—ū-blut.
Night—ū-nū-ak.
Sunrise—he-kan-yek'-pōk.
Sunset—he-kan-rek'-pōk.
Noon—ka-wa-tan-u-a-tī'-wok.
Winter—ū'-ki-ok.
Spring—ū-ping-rā'-ka.
Summer—ou'-i-a.

(10) Animals

Reindeer—tūk'-tū.
Buck (deer)—pung'--ni-uk.
Doe—nō-ral'-lik.

Buck (young)—nū-ka-tū'-ak.
Fawn—nō'-kak.
Dog—kaip'-mik.
Fox (white)—ter-re-gū'-ne-ak.
Musk ox—ū-ming-muk.
Wolf—am-mār'-ro.
Wolverene—kāk'-wik.
Crane (brown)—nek'-to-al-li.
Diver (red-throated)—pai'-uk.
Duck—pū-lū-et'-ū-ak.
Goose—ting-ni-ak.
Gull—nou-yet'-yū-ak.
Loon—kak'-kou.
Merganser—a-ān'-yek.
Ptarmigan—pe-ku-li'-a
Wavy—kang'-uk.
Fish—ye-kal'-luk.
Ling (Lota maculosa)—tik-tal'-luk.
Pike (Esox lucius)—hyū-lik.
Perch—hū-lūk-pou'-i.
Sucker—ant'-ni-ak.
Lake trout—ich-chlō'-ra.
Trout (large fish)—kek'-ki-wī-ak'-tō.
Whitefish—an-ak'-luk.
Black fly—me-lu'-i-ak.
Gad fly—a'-lung'-i-yu.
Mosquito—kik-to'-ri-ak.
Spider—ni-ni'-yo.

(11) Plants

Tree—ne-pāk'-tuk.
Shrub (small black spruce)—kai'-uk-tūk.
Wood, fallen—tīp'-ya.
Wood, dry—tīp'-i-a-lūk.
Wood, dry—pal'-luk.
Willow—ōk'-pik.
Bearberry (Arctostaphylos uva-ursi)—a-tung-gou'-lik.
Labrador tea—nū-kār-r'ō.
Grass—ī'-wi.
Moss—ō-ā'-rū.
Lichen (black hair, like)—king-oū-yak.

(12) Geographic Terms, etc.

North—wȧk-nyek-tok.
East—kā-nak-yek'-tok.
South—nig-yek'-tok.
West—ping-ak-yek'-tok.
River—kōg.
Rapid river—kōg'-ni-ak.
Rapid in river—kōg-nīk'-yū-ak.
Mouth of river—kā-tīn'-i-a.
Lake—kā-man'-yuk.
Small lake—kā-man-ou'-uk.
Very small lake or pond—te-her'-ok.
Bay—kang'-ek-luk.
Shore—hig'-gī-a.
Point of land—nū'-ūk.
Island—ka-gek'-tok.
Portage—nap'-muk.
Hill—king'-a.
Pointed hill with stone on it—ū-yār'-ra-hūg'-lūk.
Stone placed on hill—in-nūk-kūk
Stone or rock— -yār'-ruk.

(13) Geographic Names

Fort Churchill—ū-yar'-ri ig-lō.
Doobaunt Lake — tū'-li-ma-lū'-gyū-a kā-man'-yi.
Little Doobaunt Lake—tū'-li-ma-lū' gyu-et-na kā-man'-yi.
Big Lake — ang-gi-kū'-ni ka-man'-yi.
Yath, kyed Lake—hī-co-li'-gyū-a ka-man'-yi.
Child Lake — nū-tar'-a-wit ka-man'-yi.
Kamanuriak Lake—ka-man-yur'-yu-ak.
Kazen River—in'-nwi kōg.
Seal River—net-chil kōg.
Pallelluah—pal'-lel'-yūa.

(14) Social Organization

An Eskimo—īn-nwī.
Chief—ī-hyū-mat'-tok.
Trader—ī-hyū-ma-tēr'ok.
White man—kab-lū-na.

(15) nship

Son—īr-ner'-ik.
Daughter—pa'-nik.
Father—at-ta'-na.
Mother—an-nā'-na.
Wife—nū'-li-a.
Sister—nē'-yuk.
Twins—nu-kar'-a.
Grandchild—ok-kō'-ga.

(16) The Firmament

Cloud—nū-ū'-ya.
Sky—al-la-kū'-ni.
Sun—hī-ak-kēn'-i-ak.
Moon—yat-ke'.
Stars—ū-blū-ri-ak.
Aurora—ak'-ka.
Hoar frost—hā-kū-ni.
Snow—ap'-put.
Ice—hī'-kō.
Rain—ni-pal'-lū.

Water—im'-mek.
Tide—pit'-tak.
Sea—tar'-rē-ō.
Wind—an-nōr'-re.
Darkness—tā'-kū-ni.

(17) Pronouns, Adjectives, Adverbs, Etc.

I—u-wung'-a.
Thou—ig'-bi.
Small—mik'-ki-kū-ni.
Large—ang'-gi-kū-ni.
Long—ta'-ki-kū-ni.
Short—na'-hi-kū-ni.
Narrow—ik'-ik-i-kū'-ni.
Broad—i-kek'-to-kū-ni.
Light—ok'-e-kū-ni.
Heavy—ok-u-mai'-i-kū-ni.
Near—kan'-i-kū-ni.
Far—o-ma-hi-kū'-ni.
Flat—man'-i-kū'-ni.
Cold—ik'-ki
Cold—ik'-ki-an-ni-kū-ni.
Warm—ik'ki-an-ē'-kū-ni.
Hot (warm)—ū'-na-kū-ni.
Good—pī-chi-ak.
Bad—pī-tou-i-kū-ni.
Lost—na-lūn'-i-kū-ni.
Broken—he-kō-met'-uk.
Departed—oug'-luk-pōk.
That—ted-ba.
Where—nā'-ni.
There—mā'-ni.
Where is it—nan-nim'-ne.
On this side of—mi-kā'-ni.
On that side of—o-ma-tā'-ni.
To-day—ū-blū'-mi.
So—ta-man-nō.
There is none—nouk.
Plentiful—mai (in suffix).
Wanting (or no)—nā'-ga (in suffix)

(18) Verbs

To see—tak'-kō.
To sleep—hī-nik-tūk.
To portage—nap'muk-tō.
To travel—kak-mal'-tō.
To walk—pi-hūk'-tuk.
To run—ak-pā'-tō.
To talk—ok-kak'-tō.
To drink—im-ma-kyū'-ya.
To drink—im-mek'-tō.
To stoop and drink—hik-kī'uk.
To dip up—kal-u-ing'-a.
To eat—ner-rā'-yūk.
To grasp—te-hō-yuk.
To brush off the snow—ō-yek'-tok
To sneeze—tā-ri-uk-to-kū-ni.
To cry—il-luk'-kū-ni.
To laugh—kap-ma-tuk'-tō.
To be pleased—kou'-gak-tō.
To be displeased—an-nū-kĕ-ni.
To write—ik-ke-rok'-tō.
To cook—i-rē'-yuk.
To cut—kī-lēk'-tok.
To plane (wood)—hā-ner-ō'-mik.
To saw—ū-lūt.
To splash—mal'-lō.
To squeak—nī-ko-lak-tō.
It is raining—ni-pal'-i-ku-ni.
It is snowing—kan-yi-kū-ni.
It is stormy (on the weather) — at-kon-i-ku-ni.
It is lost—nou-gim-na.
It smells nice—mā-ma-ku-ni.
It smells unpleasant—ma-mai'-i-kū-ni.
I do not know—a-mī'-a-huk.
Arise—tō-pal-yer'-ik.
Go!—ūn-gak-wok'-to.
Come!—kai'-uk.

(19) New Words

Handkerchief—kon-ji-hi-nē'-rūt.
Muffler—tap'-pi.
Paper—al-li-lē'-uk.
Buttons—han-ner'-i-ak.
Tobacco—tīp'-le-tē'-rūt.
Rifle—am-me-hū-ek-ta-yū'-yuk.
Gun(single barreled)—kai-ūk-tē-tō
Gun(doubled barreled)—mal-rōl'-yī.
Gunpowder—ar'-yet.
Gun caps—ik'-ni-uk.
Bullet—kar'-i-ok.
Biscuit—nek-lū-uk.
Bottle—kī-li-an-ā'-kut.
Fork—nī-ō-gī-tik.
Plate—pâ-wu-tuk.

REGULATIONS OF VOCABULARLY OF IGLOOLIK

ESQUIMAUX WORDS AND SENTENCES

— BY —

SIR WILLIAM EDWARD PARRY

IN 1821-1822-1823.

The language of the Esquimaux is so full of words, and so varied and peculiar in the formation of its sentences that it would require a much larger acquaintance with these people, as well as far greater ability than mine, to give a satisfactory account of its grammatical construction. In the few remarks which follow, I have taken as my guide Crantz's Account of the language of Greenland and have endeavoured to trace a resemblance or to discover a difference between the two, as far as our knowledge enables us to ascertain. They are in fact, however, so nearly allied to each other, that it cannot but excite surprise to observe how slight a change time and distance have been able to effect in the language, as well as in the habits of this widely-scattered nation.

One of the principal difficulties experienced by an European in acquiring a knowledge of this language, arise from the constant blending of the several words of a sentence into one, not simply by joining them loosely together but by a regular combination of the whole, according to fixed yet infinitely varied rules. Of this peculiarity Crantz (II-224, 225) has given an instance or two, which, though extreme cases, serve to show the kind of difficulty which occurs in distinguishing the separate words of which such a sentence is comproundred.

Several of our letters, taken according to the English mode of prononciation, are not in use among these people. The letter c may at all times be very well represented by k: and f, q.,v, x anf z never, I believe occur at all of about 800 words contained in the annexed Vocabulary, I can find none beginning with the letters, b, d, g, l, r, or u. The (words so spelt by Crantz are, according to the English pronunciation, more accurately expressed by Oo, as in Oo-ang-a. Nearly the same remark applies to the v of the Missionaries, for which, in English, w must be substituted.) D occurs very seldom in the middle of a word, and b still more rarely; and in most cases these letters immediately precede the liquids l or r. It is worthy of remark, that the only exception to this that I have met with occurs in three of the words used in the games already described, where the b is followed by a vowel, as if, in the formation of these probably unmeaning words, as well as in the mode of uttering them something out of the common way had been intended by the inventor. The letter f being quite unknown to them, the first attempt at the word "fife" produced "pipe" and it was not till after much practice that they could pronounce even one of the f's with distincness.

I have remarked above that I is not used at the beginning of a word; for though it thus occurs in the conjunction loo, yet as this is invariably placed at the end of the noun or pronoun, it can hardly be considered an exception to the rule. The Esquimaux had great difficulty in pronouncing Captain Lyon's name which it was more convenient to them to change in Nayon. The letter I occurs perhaps more frequently than any other in the middle of Esquimaux words. The letters r and s are never pronounced as with us, but in a thick guttural manner, the former approximating to Northumbrian dialect and the latter to the Scotch ch (as in the word "loch") The mark over either of those letters in the Vocabulary is intended to express that sound. The r at the beginning of a word is perhaps the least adapted of any to their organs or habits of speech, and the combination of letters in the word "spring" produced from them nothing nearer than "sh-pudding". When the letter g is preceded by n, and followed by a vowel, as in anga and pingahuke, the g is sounded as in the English word "hanger" and not as in "anger". It is common for the Esquimaux to vary the pronunciation of their words at different times without altering the sense. The women, in peculiar, seem frequently to make such alterations as conduce to the softness of the words, as, for instance, by dropping h harsh final k which occurs so comconly, as Innialoo for Innialook; by changing it into a vowel, as Ne-a-ko-a for Neakoke, or by altering Oo-ee-ga in OO-ing-a or OO-tee-ma, and Hee-u-teega into Hee-u-ting-a. Other examples of the same kind occur in the Vocabulary.

The nouns substantive have three numbers, singular, dual and plural The dual generally terminates by k, and the plural with a t or an n; to there however, there are some exceptions among the following words obtained by repeatedly using the words Attowseuk (one), Madleroke (two), and Oonooktoot (a great many) respectively.

SINGULAR	DUAL	PLURAL
Keiyak	Kei-nia	Keinian
Igloo	Iglook	Igloot
Ang-oot	Angootik	Angootit
Pan-na	Pan-nak	Pannan
Innuke	In-nuke	Innueet
Ka-bloo-na	Kabloonak	Kabloonan
Took-too	Took-took	Tooktook
Oo-ming-muk	Oomingmak	Oomingmel

In the construction of a sentence the nominative case usually precedes the verb, except it be a personal pronoun, which appears always to follow the verb, as "tamooa" (I eat), and indeed, in some instances, is so connected with it as to form a single word. The accusive case often precedes the verb, as "Omut tamooa ooanga" (I am eating heart). The adjectives which I have been able to discover are so few that they are probably in this language, as in that of Greenland, of rare occurrence. Articles, I believe, they have none. The personal pronouns are as follow, nor could we distinguish any difference of pronunciation between these and the possessive pronouns. The latter always follow the substantive to which they belong.

I, Oo-ang-a	He, Oma	Ye, Illipsee
You, Ig-weet Il-weet	We, Oo-a-goot	They, Okkoa

The language of the Eskimaux abounds in verbs, there being a different one for each of several expressions which, in other languages, are either comprehended under one general term, or require a number of words to convey the meaning. To the instance quoted by Crantz (II-218) of those used to express what we call "to fish", I may add two others; Namely the variety of words they use for throwing a spear, or for putting on their clothes, the verb being formed of the noun denoting the particular kind of spear thrown or the article of dress put on. This copiousness renders it the more difficult to acquire a knowledge of the moods and tenses, especially when the words of a sentence are so closely blended as in the language. The following are the six persons of the present tense of the verb "to be well".

Nappa-woong-a	I am
” -wooke	Thou art
” -wwotik	He is
” -woot	We are
” -wootit	You are
” -wook	They are

The third person singular generally terminates in oke, and most of the verbs in the Vocabulary are inserted in this person, which the Eskimaux more commonly gave than any other. These appear to be, as in Greenland, two imperative moods, one expressing a desire and the other a summary command. This last ends in it, as "Eliiarit igloomoot" (Go away to the hut), and, when spoken with seriousness by a man to his wife or child, ensures immediate attention.

The only propositions that I have noticed (If indeed parts of speech can be so called which always follow the noun), are three; namely, mik (at), as "Igloomikpoke", (he is at the hut); mee (in, upon, or sometimes at), as "Oomia-mee", (in the ship),; "Sikhomee", upon the ice; Amitiome, at Amitioke; at moot (to), "Ooagna-moot" to the westward. These are always tacked on at the end of the noun, like que in Latin; and so is the conjunction loo (and), being pronounced with it, as if one word. Common interjection, expressing surprise and admiration, is a Hei! or Hei-ya! but a superlative degree of astonishment, mixed with pleasure, is expressed by the words A-tāmma-trānee.

The Esquimaux make much use of winks and nods in conversing. The former, which are always intended to convey a negative meaning are frequently the only reply made to a question, which a bystander might therefore suppose to be still unanswered. A nod, as with us, implies the affermative, A peculiarity in the idiom of this language which may here be noticed, is the affirmatuon of a question put in the negative in order to convey a negative reply, as "Have you not been out fishing to-day?" to which if a negative answer be intended the person says "Yes" or returns a nod,implying "I have not". I may also mention as another peculiarity in their mode of expressing themselves, a common custom of speaking of a third person, not by his own name but as "the father", husband, brother, etc., of such a one, "and this even when the individual so spoken of is brother to the person speaking. Thus, Iliglilik would often call her brother Toolooak" the son of Ka-oong-ut". In mentioning names it is not uncommon for them to adopt a mode of pronounciation differing from the correct one, and which (if the term can at all be applied to an unwritten language) may be called colloqmal; this consists in a change of the termination, as "Toolooahgioo" for Toolooak, "Oongalaghioo" for Oong-a-luk, etc., and appears equivalent to the familiar diminutives of Christian names common among us. The proper names in common use among these people are borrowed from the most familiar objects in nature, and have no reference to the qualities of the possessor , as among other savages of the North American continent. The names are common to both sexes (so at least we found them in various instances and are usually given after some of the relatives of the parents, but only on one occasion that we knew of, after the child's own parent. That they consider the sun as feminine and the moon masculine (as, indeed, do Greenlanders) may be applied from the words "neiya" and "Anunga", by which those objects are respectively called, but which literally mean "sister" and "brother". But the name of "tatkuk" by which the moon is likewise distinguished belonged to a female in the only instance we knew of its being in use

The Esquimaux are no great proficients in the science of arithmetic their numerals extending in general only to five, and then commencing again thus.

Attow-seuk	One or six
Madleroke, or Ardlek	Two or Seven
Pingahuke	Three or Eight
Sittamat	Four or Nine
Ted-lee-ma	Five or Ten

Six and seven however sometimes expressed by Argwenrak and Argwenrak-tow-a respectively; and some of the more knowing individuals go far as ten, thus

Kittuklee-moot	Eight
Mikkeelukka-moot	Nine
Eerkit-koke	Ten

But with these last, which have an evident reference to the fingers held up to represent them, very few were acquainted. In counting even as far as three they must use their fingers as auxiliaries. and before they arrive at seven generally make some mistake. Beyond nine they hold up both hands and if fifteen or twenty be required they make another person do the same, but never use their toes in this way as in Greenland (Crantz II-225).

It distresses the most intelligent person among them to exceed ten in numeration and they are always glad to get off by calling it oonooktoot, wkich may therefore imply any number from a dozen to a million. For this reason their account of a number beyond ten, unless it be of men or dogs whose name they remember, and which may thus be set down as they repeat them, is never to be depended on.

They reckon their dogs by "sleeps" (seenik), and their years by summers or winters, according as the event of which they speak accured about either of those seasons. The spring they call open-rak, but like ourselves cannot very exactly define the limits of that welcome season. They began however about the latter end of March, to talk of what had happened "in the winter". They have probably some corresponding term to express the autumn, but we had no opportunity of learning it. In one intance I heard a time described by the number of moons that had since elapsed, and with tolerable precision; but this mode of computation is not in common use, and was only resorted to from the question being put in that way. We were not aware of their making use of any other epochs, or large divisions of time, with one of which, however, our own arrival among them is not unlikely to furnish them. It is perhaps owing to their deficiency in numeration that their mode of expressing any short intervale of time behind a single day is extremely dubious and indefinite. For instance ikpokkee-anee is used indifferently to express yesterday and several days, or even weeks ago, and al-ra-nee any past period beyond a single year. If several years be spoken of they either express it by repeating "alranee, alranee", or more simply by the usual of "oonooktoot" (a great many) and always seem teazed and perplexed by more minute inquiry.

In expressing colours the same kind of uncertainty exists, except with red, white, black and grey. For blue and yellow the terms given by different persons, or by the same person at different times, are seldom twice alike, and the confession of "nelloo-ooanga" (I dont know) generally follows a closer inquiry. Dark blue they at once call black and light blue or yellow, white; as to green they scarcely ever pretend to give it a name, which, little as they are accustomed to see that colour, is perhaps not much to be wondered at.

The foregoing remarks on the language of these people comprise all the certain information I have been enabled to collect on this subject during the time of our residence with them, both at Winter Island and Igloolik. I shall close this brief sketch by the annexed vocabulary of words and sentences, (in acquiring information of this nature, at the time of our first communication with the Esquimaux; we were much assisted by a list of words and sentences in the Greenland language, for which I am indebted to the unsolicited kindness of the Reverend C. T. Latrobe, a gentleman well known and deservedly esteemed in the Christian and literary world), in which great care has been taken not to insert any of which the meaning is doubtful. That considerable caution is requisite in this respect repeated experience has taught us, as well on account of the uncertainly which must always attend a first communication with any people whose language is imperfectly known, as from the habit which the Esquimaux have of repeating any word you say, as if for the purpose of affirming it, whereas their intention perhaps is only to get rid of the inquiry. It is very common also for them when asked what a thing is, to give the hame of the material of which it is composed, or of the animal that furnished it, instead of the name of the article in its present state. If for instance, a stranger should shew a pair of seal skin mittens, and desire to know their name, an Esquimaux would in all probabilities answer "neitick", seal, or "amia" (skin) and not mention poo-a-look, till more closely questioned.

In the following collection of words, the mode of spelling adopted has been such as to render the pronunciation intelligible to an English person, by attending to the following examples of particular combinations of letters:—

A. to be pronounced as in		father
E or Ee	do	Impede, Feed
Ei	do	eider, eye
Oke	do	smoke
Oo	do	root
Ow or Ou	do	cow, fowl
Uk	do	luck
Uke	do	duke
Ut	do	cut

It is of some importance that the stress should be laid on the right syllable, to ensure which the marks used in Latin prosody have been adopted; namely long— short ⌣ the latter being usually understood where no mark is applied the mark + as already observed, denotes a gutteral pronounciation.

VOCABULARY OF IGLOOLIK

ESQUIMAUX WORDS AND SENTENCES

— BY —

SIR WILLIAM EDWARD PARRY

IN 1821-1822-1823

A

Air, or weather. Also sky or heaven Sēēla.
In the open air—Sēēlă-mĕe.
Afraid—Eerk-see.
he is—Eerk-see-woke.
Alive he is—Innūo-woke.
Alone, or by one's self—Kee-sēē-me
And or also—Loo.
Ikke-ū-tik-or.
Andromeda tetragona—skke-u-tik, or, plant—sk-see-ōō-tit.
Angry, he is—Erk-sissee-yāk-poke.
Arm, below the elbow—Tei-yāk-a-nak.
Arm, above the elbow—Akkei-ātkŏă.
Arrived, or he is—Tikkēēt-poke.
Arrow—Kākleoke.
Asbestos—Mitkŏŏ-sha.
Auk, little—Ak-palli-arioo.
Aunt—Atta.
Aurora Borealis—Arksak.
Awaken, he does—Tōōpăk-poke.
Away, or far off—Ow-a-nee.
Away, or he is—Ow-ă-nēēt-poke.
Axe—Oōlĕĕ-mŏw.

B

Back of a man—Kēē-ă-tēēkă.
Back of a wàale or seal—Arree-ang-a—Kool-lēēng-a.
Back-bone—Keimeg-lōō-a.
Bad, it is—Mă-mā-ĭt-poke—Mā-mă-īn-mut.
Bag, or pocket—Ik-pēriuk.
Bald, he is—Mīt-kŏ-ĕĕ-seenuk — Nūyă-roo-tĕ-wŏke.
Band for women's hair—To-glēē-ga
Bark, he does—Killo-mo-āk-poke.
Bear, a—Nennook—Nannoke.
Beads—Hu-nōw-yak.
Beard, or mustachios—Oŏ-mitkee.
Beat, he does—Tiglik-pākma.
Bend, it does—Ning-ōō-oke.
Belly, of a man—Nēiyuk—Nēidiek
Belly, of a whale or seal—Tēēma.
Berry, a—Pā-ŏŏnă-rōōtik.
Big with young, she is—Sing-ĕi-wŏke.
Bird—Ting-mēē-ya.
Birch—Oke-pēē-yak.
Bite, he does—Kă-ŏ-lōke-poke. — Mikkeek-poke.
Black, or dark coloured, it is — Kēr-niuk-toke.
Bleed, it does—A-ŏo-nāk-poke — A-ōōk-poke.
Blood—A-ōō-nak.
Blow, he does—Su-blōō-ăk-toke-poke.
Blow, it does (as a whale) — Pōō-ĕe-wŏke.
Blue, it is—Kōw-lŏok-poke.
Boatswain (bid)—Is-sū-nak.
Boil, it does—Kal-lāk-poke—Ikkō-a-lāk-poke.
Bone—Heōw-nik.
Book—Titterow-yak.
Boot—Allek-tēēga — Mitko-leega —Kamēēga.
Boot, he puts on his—Ka-meeg-poke.
Boot, ankle boots—Pīnnĕĕ-rā-rā.
Bore or drill, he does—Ikkōō-tŏk-pŏke.
Bow, for shooting—Pit-tēē-kee.
Bow, he shoots with a—Pittēēk-seăk-poke.
Bow, for drilling—Kēi-woot.
Bow-case—Pittēēk-sičk-tăk.
Bowl of wood, like a butcher's tray —Poo-ōō-tok.
Box—Illēē-wĕ-ăk.
Braces for children's clothes — Hwēē-tĕ-ū-tă.

Bracelet—Seap-pāng-a.
Brains—Kārrĕtăk.
Brass—Ka-kō-blek.
Break—Now-īk-poke — Kēēk-tŏ-āk-poke.
Bread—Shē-gă-lak.
Bread-dust—Kă-nīk-roŏt.
Breast of a woman—Oō-ĕe-āg-nig.
Breast, bone—Toonēk-ū-ă.
Breeches—Kaklēē-ga — Kakleek.
Breeches, he puts on his—Kaklēēk poke.
Brent, goose, or barnacle—Nŭr-glŭk.
Bristles—Oōmia.
Brother—Kattangōōtee anēēga(or anninga).
Brown, it is—Kēi-yŏke-toke.
Buoy (made of an inflated seal skin)—How- wūt-tak.
Burn, it does—O-ŏ-nāk-poke.
Button—Ichĕ-rēē-yuk.
Butterfly, a—Tākkēē-līkkēē-tā.

C

Calcareous spar—Oku-rēē-yuk.
Calm, it is—Ilēē-ūng-năk-poke.
Canoe—Cei-yāk.
Canoe, he paddles a—Kei-yāk-tŏ-poke.
Cap, or hood—Nēi-seak.
Charm, a skin stap worn as a — Oo-yă-mēē-ga.
Cheek—Oōlniak — Oō-lōō-ă-ga.
Chew, he does—Ang-ōō-lă-woke.
Chin—Kablōōga.
Clay, slate—Ow-wēē-wiuk.
Clench his fist, he does—Eēr-kĕet-poke.
Climb, he does—Mā-yŭ-āk-poke.
Cloud—Noo-wōō-ĕ-ă..
Coal—Aggă-ē-ă
Cald—Ik-kee.
Comb—Ilia-ū-tik.
Come, here—Kēi-lēē. Kārree.
Come here (more commanding — Kĕiliarit.
Come here, he does—Kēi-wa.
Come down—Ka-nōōng-a.
Come or go in—Ittiek.
Come shall I ?—Ittiek-lāng-ă ?
Come out, it does (as an arrow)—Kat-tāk-poke.
Conjuror, or Sorceror—Ang-ĕt-kook — Annăt-kō-ă —Annātkŏ.
Copper—Ka-nōō-yak.
Cough, he does—Ko-āktŏ-poke.
Crane (bird)—Tattēē-lĕe-ārŭok.
Cry, he does—Kēi-ă-woke.
Cup, or bowl of musk-ox horn — Kei-yū-tuk.
Cut, he does — Sōwĕ-āk-poke — Sowĕ-rōke-poke — Pilliuk-tŏke-poke.

D

Dance, he does—Momēk-poke.
Dark—Tak.
Dark, it is—Tāk-poke.
Dart for birds—Nōō-gŏo-ĕe.
Daughter—Pannēēya Pannēē.
Dead, he is—Tōkŏo-woke.
Dirt—Ippūk.
Dirty, he is—Ippŭk-poke—Oo-īn-ya.
Dive, he does—Atkă-moke — Atkāk-poke.
Dive, it does into a hole as a seal—Aglŏok-poke.
Dog—Mīkkee — Kei-meg.
Draba alpina (plant)—Nap-pŏo-yat.
Dream, he does — Seenik-tōōmŏ-wŏke.
Dress victuals, he does—Koo-līp-siuk-poke.
Dress (with clothes,) he does—An-nō-ăk-poke — Kap-pēēt-poke.
Drill, a—Ik-kōō-tak.
Drill, bow of—Kēi-woot.
Drill, he does—Ik-kōō-tŏk-pŏke.
Drink, he does—Immiek-moke.
Drinking-cup—Im-mōō-chiuk.
Drop, it does, as water—Kōō-tŏo-āk-poke.
Drown, he does—Ippĕe-woke.
Drum or tambourine—Kēi-ia-ōw-tik.
Drunk, he is—Tōkŏo-yākpoke.
Dry, it is—Pān-nĕk-poke.
Duck, king—Mīt-tiek.
Duck, eider—Am-mŏw-līgŭŏk.
Duck, long tailed—Al-diggee-ārioo.
Dust—Oke-oke.

E

Ear—Hēē-ŭ-tēē-gă — Hee-u-ting-a.
East—Nēē-yuk.
East, to the—Nēē-yŭk-mĕe.
Eat, he does—Tamōō-ă-woke.
Egg—Mannig. Pl. Mannian.
Eight—Pīng-ă-huke.
Eight—Pīng-ă-huke — Kit-tūk-lĕe-moot.
Eighth—Ping-ă-hū-at.
Esquimaux—Innūeēt. (Pl.) when strangers. Sead-lēr-mĕ-ŏo.

Elbow—Ikkŏ-sēē-gă.
Ermine—Ter-rēē-ga.
European (sub)—Kablōōma.
European (adj)—Kāblōō-nāk-ta.
Eye—Ei-ēē-ga.
Eye, he has an inflamed — Illĕe-ū-poke.
Eye-lash—Kei-ma-rēi-yak.
Eye-brow—Ka-blōōt-kee.

F

Face—Ke-nār-ră — Ke-niak.
Fall, it does—E-ū-kă-poke —E-ū-kak-poke.
Fall, the tide does—Ting-īng-ōō-ŏke.
Far off—Ow-ā-nĕe.
Far, he is—Ow-ā-nēēt-poke.
Fat, he is—Ow-ĭn-nĭk-tōō-woke.
Father—Attāta.
Father or mother in law—Sākkee.
Fawn, a—Nōke-wa.
Feather—Shōō-look. Plur. Shōō-lŏoă.
Female, of any animal—Arūg-nă.
Fern—Oo-ēē-beit.
File, a—Arrēē-yak.
Finger, a—Tik-kiek.
Finger, the first—Tik-kēē-ĕ-răk.
Finger, middle—Kei-tūk-lie-rak.
Finger, third—Meikkēē-lie-rak.
Finger, little—Irkītkŏă.
Fire—Ikkooma.
Fish—Ekkalook — Ekkăloo.
Fish hook—Kabloōkia.
Five—Tēd-lĕe-mă.
Flesh of any animal—Nēērkee.
Flipper of a seal, fore — Tāllă-rōō-ĕe.
Flipper of a seal, hind—Sikkŏō-ĕĕ.
Fœtus of a seal or walrus — Ib-lĕe-ŏw.
Foggy, it is—Tūk-ouik-poke.
Food—Ta-mōō-a.
Foot of man, or other animal — Itti-krik — Itti-kūt-ka — Tttĭ-gĕi.
Foot-print—Tōō-ma.
Forehead—Kă-ōw-ga.
Fork, a—Kap-pōō-loot.
Four—Sīttă-măt.
Fox—Tērrĕe-ānĕe-ārĭŏe.
Fresh (not salt)—Tēi-seuk.
Frost-bite—Kir-kee.
Frost-bitten, it is—Kir-kēēt-poke.
Frozen, it is (as meat)—Kir-kĕe-wŏke.
Full, he is—Akĕiŏ-tōke-poke.

G

Gaiters for boots—No-blōō-lĕe-tă.
Give—Pĭlletāy.
Gloves—Adĕe-ēidĭĕt.
Go away (very commanding)—Eiliarit.
Go away to the huts — Eiliarit-iglōō-moot.
Go—Annee. Attee.
Go, shall I?—Anneel-yānga?
Gone far away, he is—Ow-dlāk-poke.
Good, it or he is—Mamūk-poke—Mamūk-mut.
Grandmother—In-rŭ-tā.
Grass—Eē-week.
Graze, it does (as a deer)—Nĕerēē-lēk-poke.
Great many — Oonōōk-toot — Oonōōk-pōot.
Green—Tōōng-ook.
Grey—Kei-er-rā.
Grow, it does (as a plant)—Nōw-oke.
Growl, he does—Kăttĕe-māk-poke.
Gull, glaucous—Now-īdioke.
Gull, silvery—Now-ya.
Gull, labine—Erkĕet-yūggĕe-ārioo
Gums of a man—It-kēēt-ka.
Gun, a—Hēē-ĕk-kōke-lĕē-gŭ.

H

Hair, human—Nu-ti-āk-la — Nu-yāk-ka.
Hair, of fur—Mitko.
Hand, a—I-yūte-kă — Addee-yūt-kă.
Hare—Oo-kă-lik.
Harness for dogs—An-noo.
He—Oma. Oo-na.
Head—Nē-ă-kŏke — Nē-ă-kō-ă.
Hear, he does—Tō-chiă-wăt.
Heart—Omut.
Heavy, it is—Oko-mā-it-poke.
Heel—Kim-mēē-ga.
Here—Mānee — Mēr-ya — Mo-rong-a — -ō-a.
High, tall, or large, he ot it is — Ang-ĕ-woke.
High, the land is—Nōōn-āng-ĕ-woke.
High, it is high (applied to inanimate objects only)—King-ēēt-poke — Poōk-tōo-woke.
High, as the sun—Pōw-nă.
Hoole, a—Poo-tōō-a.
Hoole, the circular in a canoe — Pā-kiut.

Hood of a jacket or a cap — Nēi-seak — Nei-ke-ā-ga.
Hood, he puts on his—Nei-seāk-poke.
Hood, he puts off his—Nei-se-ēk-poke.
Hoop, he does—Nănnēē-yăk-pŏke.
Horns of reindeer—Nāg-gĕ-ŏ.
Hot, or warm—Ok-ko.
House-mate—Iglŏg-ă-tēēga.
How?—Kanno ?
How many?—Kāp-see ? — Kāp-seĕ-nĕe ?
How do you do ?—Kānnŏ-ĭk-pīssee! Answer allways .made to the above (literal sense uncertain) — Kānnŏ-ĭng-īlĭă-goot.
Hummock of ice—Ma-nēē-lia.
Hungry, he is—Nēē-lik-poke—Kā-lĕk-poke.
Husband—Oo-ēē-ga — Oo-īng-a—Oo-ēē-ma.
Hut, or house—Igloo.
Hut, he is at the—Igloo-mīk-poke.

I

Ice—Sikkoo.
Ice, upon the—Sikkōō-mee.
Iceberg—Picca-lŏo-yak.
Indians—Eērt-kĕi-lēē.
Inlet, an—Kāng-ĕk-loo.
Instrument of bone for discovering seals under ice—Keip-kūt-tuk
Instrument used by women for making holes—Ee-īl-lĕ-ŭ.
Intestines of any animal—Innia-look—Innia-loo.
Joint of do—Nāb-gŏo-ang-a.
Iron—Sow-ik.
Iron-stone—Kal-lōōg-nuk.
Ivory—Tōō-wa.

J

Jacket, under—Attēēga — Attēē-gĕ-gă.
Jacket, upper—Cappee-tēgga.
Jacket, he puts on his—Attēē-gĕ-woke.
Just now (used for past and future, also for "wait")—Oo-īt-tia.
Just so—A-meel-ya —It-kŏ-mĕe.

K

Kidney—Tāk-to.
Kil, he does—Tō-kŏo-pŏke.
Knee—Sit-kŏ-ă.
Knife, an Esquimaux man's — Pānnă.
Knife, other—Pillia-wow-yak.
Knife, a clasp—ōkŏo-tāk-toke.
Knife, a woman's—Oō-loo.
Knot, a, he ties—Kei-tuk-poke.
Knot, a, he ties, he unties—E-yū-nŭg-poke.
Know, I do not—Nēlloo-ooanga—Nelloo-ooanga-nā-ŏ.

L

Lamp of stone—Kōōd-lĕ-ŏok.
Lamp, (trimmer of asbestos—Tat-ko.
Lamp-black—Pā-ŏo.
Land, or country, also a plant — Nōōnă.
Lapland finch—Kerniuk-tārioo.
Laugh, he does—Iglă-pŏke.
Lay, a thing down, he does—E-lĕe-wă.
Lead (metal)—Ak-kīl-lĕ-rook.
Leather, dressed—Kee-ūk-tok.
Leg of a man, below the knee — Kan-nā-ra.
do above do or thigh—Kōke-tŏ-kak.
Leg of a quadrupel, below the knee —Nĕe-yoōng-ă.
Lend, he does—Atōke-poke.
Lie—Shāg-loo.
Lie, you tell a—Shāg-loo-ik-pōōtik.
Lich, he does—Allōōk-toke.
Lick, it (imper)—Allōō-pa.
Licken, of three kinds—Ko-ă-yow —Tee-rōw-yat — Oka-yute.
Light, (not dark) it is—Kā-ŏ-mō-poke — Ka-o-māk-poke.
Light (not heavy) it is—Okit-tū-nak.
Lightning—Kadloome. Ikkōōma.
Lights of an animal—Akkēia-gōă.
Like this, or in this manner — Immūn-nă — Im-mŭn-nay.
Like, it is like—Immun-ittioke.
Lime-stone—Kakote-tūng-ŏ-ă.
Line of thong—Allek—Aklŭnăk.
Line platted, of sinew—Pellera.
Lip, upper—Kākkĕe-wĕ-ā-ga.
Lip, lower—Ka-klōō-ga — Kā-klōō ăk.
Listen, he does—Nā-lŭk-poke.
Little—Mikkee.
Little he or it is—Mikkēēt-poke.
Liver of an animal—Ting-ŏ-ă.
Long time ago—Al-ră-nee.
Look, he does—Kēi-niuk-poke.
Looking-glass—Tak-hāk-toot.

Louse—Koo-muk.

M

Make faces, he does—Ikko-yūk-poke.
Male of any animal—Ang-oot.
Mark, a—In-nik.
Marmot, a—Ikkiek — Sik-sik.
Marrow—Pāttek.
Marrow-spoon—Pattēk-nĕŭk.
Melt, it does—Kōōssiuk-poke.
Mica—Kēi-blia-kē-ă.
Milk—Im-mook.
Mitten—Pōō-ă-lŏok.
Moon, the—An-ningă.
Moon, her name—Tāt-kuk.
Moon, is full—Nāk-kŏke-poke.
Moon, is in her quarter—Kōōd-lĕ-rŏke-poke.
Moon, shine—Kow-mal-lūk-poke
Morning—Oō-blak.
Moss—Mān-nek.
Mother—A-mā-ma.
Mother as spoken by infants — A-nā-na.
Mountain—Kīng-nak.
Mouse—Ow-īn-yuk.
Mouth—Kan-nēē-ra.
Musk-ox—Oōmĭngmuk.

N

Nail of finger or toe—Kooke.
Nail of ivory, for stopping the wounds in seals, etc—Too-pōō-ta.
Name—Aka. Dual. Attik.
Name, what is your?—Kēē-wit?
Name, what is his?—Kee-wōw-na?
Narwal—Keina-lōō-a.
Neck or throat—Toke-lōō-ga.
Needle-case—Attĕrăk.
Nest, a bird's—Oo-bloo-it.
Nephew, or Niece—ōyŭ-ōgă.
Net over the lamp—Innētăt.
Night—Oo-nŏo-ăk.
Nine—Sīttă-măt.
Nine—Sīttă-măt — Mīkkĕe-lūk-kă-mŏot.
No—Nāk-ka — Nā-ŏ.
Negative, used with verbs—Ilia.
No more—Tug-wa — Tēi-wah.
Nod, he does nod—Poong-āk-poke. —Ang-ĕk-poke.
North—Kan-nūng-nak.
North, to the—Kan-nūng-năk-mee.
North, wind, blows from the—Kan nūng-năk-poke.
North-east—Akkood-lōōnawōōk
Nose—Kēi-nak — King-āră.
Nostril—Pāng-a.
Now—Māng-a.

O

Oil, or blubber—O-kŭ-ă.
Old, he is—It-tōōt-loo-āk-poke.
One—At-tōw-seuk.
Open the door, he does—Mak-pēk poke.
Ornamental land for the head of Esquimaux men—Muk-kēēf-yŭ-tik.
Ornament of brass or copper worn on the forehead by Esquimaux women—Kōw-woot.
Overset, it does—Kig-nōō-woke.
Owl—Ook-pēē-guak.

P

Paddle, a—Pa-ōō-tik.
Paddle a canoe, he does—Kei-yāk-tŏ-pŏke.
Pimple—Kang-ring-māng-a.
Pin, a—Too-poo-tōw-yak.
Plant, a—Noona.
Plat, I do—Pēllĕray-ōōnga.
Plover, golden—Tōōdlēe-ārioo.
Pluck off, he does—E-re-tāk-poke.
Plug, cork, or stopper (also used for islands lying in the middle of channels)—Khēming.
Plug, or stop up, he does—Klēmig-pa.
Pocket or Bag—Ikpētiuk.
Poppy (Papever Nudicaule — O-suke.
Pot for cooking—Oōt-kŏo-sēĕk.
Pot-stone—Oot-koo-sēēk-seak.
Pull, he does—Nu-hūke-poke — Nōō-kĭt-poke.
Pull, one's hair, he does—Nu-yāk-tŏ-poke.
Push, he does—Nee-pāke-poke — A-yow-ŭk-poke.
Pyrite, iron—Inneuk.

Q

Quartz or any stone like it—Too-nōō-yak.

R

Rain, it does—Mak-kōōk-poke.
Raven—Tōō-lōō-āk.
Raw, (as meat)—Mik-kĕ-ŭk.
Red, it is—A-ŏo-pă-lŏok-poka.
Rib, small—Na-tāt-kŏ-ă.

Rib, large—Tŏolĕmak.
Right, that is—Ti-mūn-nă — Ti-mūn.
Ring, for the finger—Ikkŭt-komĕŏ-tăria.
Ring, it does (as metal)—Hū-ă-nūk-pă-took-poke.
Rise, it does (as the tide)—Oo-līng-ŏo-oke.
River or stream—Koo.
Roll, it does—Aksea-kā-ă-woke.
Rough, it is—Mannēĕliut.
Round, it is—Àng-mă-lō-ĭk-poke.
Rub, he does—Al-lāt-tŭk-poke.
Ruff for the neck—Nak-see-ānga.
Run, he does—Akpa-yūke-poke
Run, fast—Sukă-woke.
Run, it does (water)—Koo-ōōk-poke.
Run, slowly—Su-keīt-poke.
Rust, it does—Okōōk-poke.

S

Salt, or salt water, also the sea — Tărrĕŏke.
Sand—Seōkat.
Sand-piper—Siggee-āree-ārioo.
Sand swiss—Tōōlee-ārioo.
Saw, a—Kibloo.
Saw, he does—Oo-lōō-ăk-pŏke.
Saxifraga Oppositifolia (plant) — Kakeed-āng-nut.
Scissors, a pair of—Kiblee-ōw-tik.
Scraper, for cleaning skins—Seāk-koot.
Scratch, he does—Koo-mīk-poke.
Seal, large (Phoca Barbata) — Oguke.
Seal, small (Phoca Hispida) — Neitiek.
Seal, middle-sized—Kairōlik.
Seal, young of the—Iblĕeow.
Sealing, excursion, he is gone on—Neitiek-poke — Mā-ōte-poke.
Seal-hole—Agloo.
Seven—Argwēnrak-tōwa — Madleroke — Tīkkēemoot.
Sew, she does—Mīk-tiek-poke — Mērk-siek-poke.
Shade for the eyes—Ittee-yāga.
Shave, he does—Oo-mi-āk-poke.
Shell of a snail—Seu-tĕ-rŏŏk.
Shine, it does (as the moon) — Kow-mal-lūk-poke.
Ship or boat—Oomiāk.
Ship at ship or on board the — Oōmĭamĕe.
Shoe—Ittēē-gĕ-gă.
Shoulder—Too-ēē-ga — Nē-gă-blō-ă.
Shrimp—Pāmēē-ōō-lĕe.
Shut the door, he does—Sikkĕe-wake.
Sick, he is—Annēē-ăk-poke.
Sigh, he does—Annek-seāk-poke.
Silver or tin—Im-root.
Sinew—E-wāl-loo.
Sit down—Ingit-poot.
Sister—Kattang-ootee-Neiya.
Sister in law—Okŏo-ārră.
Six—Argwēnrak.
Sing, he does—Immiek-poke.
Skin—Ameg—Amia.
Skin of walrus—Kā-ŏw.
Skin of oguke—Kēi-seek.
Skin of whale—Māk-tuk.
Skin-vessel, placed under a lamp —Ar-nāg-wĕ-ŭ.
Skin-vessels, small bucket shaped —Kei-ning-rak — Kāt-tak.
Skin of deer, made into a blanket—Keipik.
Skip a rope, he does—Kāllĕe-wuk-tăk-toke — Arnow-yāk-toke.
Sky—Keiluk — Sēē-la.
Sledge, a—Ka-mōō-tik.
Sledge, he draws a—Kamook-see-ērră-poke.
Sleep, he does—Seenĭk-poke.
Slide down, it does—Sittŏo-woke.
Sling for stones—Illew.
Small, he does—Mikkee.
Smell, he does — Nei-woke —Nei-wa.
Smoke, also fog—Issiek.
Smoke, it does — Irriek-poke — Pe-u-ōke-poke.
Smooth—Mannēēra.
Snare for birds—Nēē-yak.
Sneeze, you do—Tāgĕă-pootik.
Snore, he does—Kamōō-e-wŏke.
Snow—Appoo.
Snow it does—Kan-ne-ūk-poke.
Snow-drift—Nāttĕe-rōō-ik.
Snow, there is some—Nattee-roo-īk-poke.
Snow-goose—Kāng-ook.
Snow-hunting—Kōpĕnnŏ-āccă-ŭ.
Son—Eernīng-a — Eer-nēē-ra.
Son, she bears a—Eernēē-wŏke.
Sore, it is—A-ang-mut —A-ā-poke.
Sorrel—Kong-ŏ-lĕk.
Soup—Kāyo.
South—Ping-ūng-nak.
South, to the—Ping-ūng-nā-mēe.
South-west—Oo-āgnărīt.
Spade for snow—Poo-alle-rāy.
Spear for small seal—Oo-nak.

Spear for large seal—Aklĕĕ-ak-or Aklēēga.
Spear for walrus and whale—Kat-tēĕlik.
Spear for deer—Ippoo.
Spear for salmon—Kākkĕĕ-wĕi.
Spit, he does—Kei-se-ūk-poke.
Spittle—Nōō-ă-gă.
Spoon—Ilia-oot — Alloo.
Spirit—Tōōrngow — Toorng-ă.
Spring—Opēn-ră.
Square, it is—Kik-parrīk-poke.
Squint, he does—Nak-kōō-woke.
Stab, he does—Kappēē-woke.
Star—Oo-blōō-riak.
Star-fish—Addĕe-yūggĕe-yū-ĕ-yĕt
Stand up—Nekko-īgliee.
Steal, he does—Tīglik-poke.
Stone—Oo-yar-rā.
Stone for sharpening a knife—Ar-rēē-yak.
Straps used by women for carrying their childrenn—Kākeo-mōwtik.
String for a bow—No-āk-tă.
Suck at the breast, he does—Ammā lāk-poke — Millu-kāk-poke.
Suckle a child, he does—Amā-mŏok-pŏke.
Sun, the—Nēi-ya.
Sun, its name—Suk-kĕ-nŭk.
Sun rises—Nē-wĕ-woke.
Sun sets—Nīp-pĕ-woke.
Summer—Ow-yak.
Summer, in the—Ow-yā-mĕe.
Swallow-pipe of an animal—Iggee āng-a.
Swan—Kō-guke.
Sweat, he does—Ow-mīdia-poke.
Swim—Nalloke-poke. Immărŏke-poke.
Surprised, he is—Nannĕrāk-poke.

T

Tall, he is—Ang-ĕ-wŏke.
Talk, he does—Okād-lŭk-poke. Okāk-poke.
Tail of a quadruped — Pāmĕĕ-yōōng-ă.
Tail of a whale, seal, etc—Seāk-peek.
Take (also used for adopt)—Tēēgo.
Tattooing—Ka-kēē-na.
Tear, he does—Allīk-poke.
Ten, he does—Eērkĭt-kŏke.
Tent—Tōō-pek.
Tent-pole—Kān-na.
Thanks—Koyēnna.
That—Oo-na — Tām-na.
There—Ta-mā-nee — Ta-mei-ya.
They—Okkŏā — Kāt-kŏ-ă.
Thief—Teglĭktoke.
Thimble—Tikkiek.
Thin, he is — Koo-īnnĕe-woke — Seād-poke — Seād-mut.
Those—Māk-kŏ-ă.
Thread a needle, she does—Noo-wēē-woke.
Throat—Toōp-kŏo-ĕe-īd-yuk.
Throw a spear, he does—Akle-āk-poke.
Throw, a stone, he does—Mē-lŏ-ĕi-āk-poke.
Throwing-stick—Noke-shak.
Three—Ping-ā-huke.
Third—Ping-ā-hu-at.
Thumb—Koo-blōō-ga.
Thunder, it does—Kād-lūk-poke.
Too, and; or also—Loo.
To-day—Oo-blōō-mee.
Toe, great—Put-ōō-go.
Toe, second—Tikkēē-ĕ-rak.
Toe, third—Kei-tuk-kleirak.
Toe, little—Ir-kit-ko-a.
Toe, fourth—Mikkēē-lierak.
To-morrow—Ak-kă-gōō.
The day after to-morrow—Akka-goo-ōōng-ă-lu-ā-gōō — Akkagoo-ōōng-a-lu-ā-nu.
Tongue—Okkāra.
Tooth—Kē-ŭ-tēēt-kă.
Touch, he does—Ak-tōke-pa.
Tickle, he does—Kōō-ĕe-nūggĕ-wak
Trap, a—Pood-lut.
Tremble, he does — Pāng-ă-līk-poke.
Tree, a—Na-pāk-to.
Triangular, it is—Nōōlōō-ārrik-poke.
Trim a lamp, she does—Tatkiūk-poke.
Turnstone (bird) — Tāllĭg - wĕe - ārioo.
Two—Mādlĕrŏke — Ardlek.

U

Uncle—Ang-a.
Unclench his fist, he does—Issee-wēēt-poke.
Undress, you do—Makta-pootik—Marta-pootik.
Undress, he does—Mattāk-poke—Teide-ōke-poke.
Unplug, he does—Noo-shōōk-pa.
Upside down, it is—Rood-yūng-ă-woke.

V

Vaccinum. Uliginosum, (plant)—Okōw-yet.

Valley or Low-Land—Nāk-seak.
Very or extremely—Lu-kōw-nee.

W

Wait, (see "just now")—Oo-it-tia.
Walk, he does—Pe-hūke-poke.
Walk, fast—Otūk-tăk-poke.
Walk, slowly—Pĕ-hū-ĕi-āk-poke.
Walrus—Ei-ŭ-ĕk.
Walrus, he is gone to kill—Ei-ŭ-ĕk-poke.
Warm—Oke-kŏ.
Wart, a—Oōng-nōō-ă.
Wash, he does—Eermīk-poke.
Water—Immek.
Water, in or on the—Im-mĕk-mee.
Water-fall—Kog-lū-nuk.
We or Our—ŏo-ă-gŏŏt.
Weed, sea (tangle)—Kītkŏ-ă.
do do, another kind—Mīn-nŭ.
Well, he is—Năppă-woke.
West—Oo-āg-nuk.
West, to the—Oo-āg-nă-mee—Oo-āg-nă-moot.
West, wind blows from the—Oo-āg-nŭk-poke.
Wet, it is—Kōw-ĕe-ūk-poke.
Whale—Agga-wek.
Whale bone—Heōke-kŭk.
Whale blubber or oil—Ok-ŭ-ă.
What—Sū-na — Su-mee —Su-mig.
What is that?—Suna Oona?
When?—Kaikŏgŏ? — Kăng-ă?
Where?—Nēm-moot?
Where, speaking of a distant place —Nēm-mŏo-mee.
Wheb a knife, he does—Ar-rĕ-āk-poke.
Whine or Cry, he does—Kei-yă-woke.
Whip, a—Ippĕe-rā-ŏ-tuk.
Whip, he does—Ippĕe-rā-ĕ-ŏke-poke.
Whispe, he does—Issĕe-bĕ-yūke-poke.
Whistle, he does — Oo-in-yā-tŏ-pŏke.
White, or any light colour, it is — Kow-dlōōk-poke.
Who?—Kē-nă? — Pē-nă?.
Who is that?—Kena Oona?
Whose?—Kē-a?
Wife—Nool-lēē-ă — Nōōl-lĕe-āng-a
Willow, flower of, used as tinder—Hu-pōō-tik.
Wind—Anŏ-ĕe.
Wind blows fresh—Pēk-siĕk-poke
Wind blows hard — Annō-klŭk-poke.
Wind-pipe—Toch-lŏo-a.
Window—Ig-gŭl-lăk.
Wink, he does—Sikkoo-niūk-poke.
Winter—Okĕŏke.
Wolf—Amărŏke.
Wolverene—Kablee-ārico.
Woman or Female generally — Arūg-na.
Wood—Kēi-yŭ.
Wood, grows—Kēi-yŭ-kāk-poke.
Would, he does—Nīm-mĕ-ūk-poke
Wrist—Al-yōw-tĕe-ga — Adēē-yōw tĕ-gă.
Write, or Draw, he does—Tittee-rāk-poke.

Y

Yawn, he does—Eitĕŏw-poke.
Yellow, it is—Tōōng-ŏok-poke.
Yes—Ap.
Yesterday—Ik-pōke-yuk.
Yesterday, the day before(used also for sometime ago)—Ik-pŏke-kĕe-ā-nĕe.
You, (singular)—Ig-weet —Il-weet
You, (plural)—Illīp-see.
Young, he is—Māk-kŏke-poke.

HPolar
T7892c
170353.
Author Tremblay, Alfred
Title The cruise of the Minnie Maud. tr. by A.B.Reader.

University of Toronto
Library

DO NOT
REMOVE
THE
CARD
FROM
THIS
POCKET

Acme Library Card Pocket
Under Pat. "Ref. Index File"
Made by LIBRARY BUREAU

UTL AT DOWNSVIEW
D RANGE BAY SHLF POS ITEM C
39 14 09 22 07 009 8